A PEOPLE'S HISTORY OF INDIA 2

THE INDUS CIVILIZATION




Irfan Habib



The Indus Civilization by Irfan Habib is the second monograph in the People's History of India series. It continues the story from the point reached in the earlier monograph, *Prehistory*. The dominant theme here is provided by the Indus civilization. In addition, other contemporary and later cultures down to about 1500 BC, and the formation of the major language families of India, are discussed.

The Indus Civilization seeks to maintain uniformity with *Prehistory* in style and framework, except for slight relaxation of the commitment to conciseness. It contains more detailed exposition of certain topics, and the explanatory notes on technical and controversial subjects at the end of each chapter are somewhat longer. Illustrations, maps and tables are included to serve as aids to understand the subject better.

The time with which this monograph deals is often called Protohistory, since it is close to the period when history can, at least partly, be reconstructed from literary texts. Since modern territorial boundaries make little sense when we deal with the past, India here means pre-partition India, and the area covered includes Afghanistan south of the Hindukush mountains. A sub-chapter is accordingly devoted to the Helmand civilization, whose study is indispensable for putting the Indus civilization in a proper perspective.

A People's History of India

1 Prehistory

2 The Indus Civilization

3 The Vedic Culture and the Dawn of the Iron Age

The Aligarh Historians Society, the sponsor of the project of *A People's History of India*, is dedicated to the cause of promoting the scientific method in history and resisting communal and chauvinistic interpretations.

A PEOPLE'S HISTORY OF INDIA 2

THE INDUS CIVILIZATION

Including Other Copper Age Cultures and History of Language Change till *c.* 1500 BC

Irfan Habib

Aligarh Historians Society



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Preface

This monograph forms the second instalment of the projected People's History of India, and continues the story from the point reached in *Prehistory*, published last year. The dominant theme here is provided by the Indus civilization; in addition, other contemporary and later cultures down to about 1500 BC, and the formation of the present major language families of India, are also treated.

In style and framework *The Indus Civilization* seeks to maintain uniformity with *Prehistory*. Perhaps, the commitment to conciseness has been relaxed a little, as room has had to be found for a more detailed exposition of certain topics, and the explanatory notes on technical and controversial subjects suffixed to each of the three chapters are somewhat longer.

The reader is reminded that, as in *Prehistory*, so here too, India means pre-partition India, though in certain contexs it may carry the more restricted sense of the present-day Indian Union. Since modern territorial boundaries make little sense when we deal with the past, the area covered in this monograph includes Afghanistan south of the Hindukush mountains. A sub-chapter is accordingly devoted to the Helmand civilization, whose study seems indispensable for putting the Indus civilization in a proper perspective.

The time with which this monograph deals is often called Protohistory, since we are now getting close to the period when history can, at least partly, be reconstructed from literary texts. Words from such texts or reconstructed words attributed to early languages occasionally occur in the present monograph in the discussion of certain matters, though their number is necessarily small. The quoted words are still too few to merit troubling the reader with separate explanations of the standard systems of transcription and transliteration. Since, without such explanations, diacritical marks as well as the additional characters used by historical linguists drawing on IPA might not be understood, I have employed the English letters closest to the original sounds. I have, therefore, spelt 'Rigveda', not 'Ṛgveda'; and 'Ashoka', not

'Aśoka'. This practice may not be followed in the succeeding monographs, depending on the decision of their authors.

I am grateful for the generally favourable reception given to *Prehistory*, and for the many suggestions offered for improvements in presentation. A sympathetic reviewer raised the problem of references. It would be appreciated that in a work like this, meant for a wide readership, it is not possible to encumber it with references in footnotes for the various statements made, nor is it possible to convert the bibliographical notes into exhaustive lists of the books, reports and papers consulted by me. Extensive bibliographies will be found in most of the works mentioned in the bibliographical notes. The purpose of the notes themselves is chiefly to guide the reader to the works where substantive or updated detailed information is available. Many earlier, even pioneering, works have had to be ignored in order to make the selection meaningful. I sincerely regret such omissions, but I fear I can see no solution.

That the People's History of India project is alive is due largely to the generous initial grant from the Madhya Pradesh Text Book Corporation, Bhopal, to whom much gratitude is due. That it is proceeding rather slowly is solely the fault of the undersigned as editor.

In respect of this monograph, I should like to acknowledge the great kindness of Professor Suraj Bhan, the eminent archaeologist, who agreed to vet the manuscript at short notice. All the maps (except Maps 2.2A and B) have been drawn by my son, Faiz Habib. Amber Habib spoilt a holiday in going over the text with me. Mr Ghulam Mujtaba took photographs for the figures in the book. Mr Muneeruddin Khan spent many hours in processing the text, and he deserves my thanks for this, as well as for his patience in incorporating changes made in the text over and over again.

On behalf of the Aligarh Historians Society, Professor Shireen Moosvi has been responsible for all the organizational work that the project has entailed. Mr Rajendra Prasad and Ms Indira Chandrasekhar of Tulika Books have given me guidance and help, and done much to ensure that presentable volumes emerge from this enterprise.

November 2002 IRFAN HABIB

1
Early Bronze Age Cultures of the Indus Basin and the Borderlands

1.1 Towards 'Urban Revolution'

Over seventy years ago the discovery of Mohenjo Daro in Sindh led to the recognition that it and Harappa in the Punjab were the earliest cities of India, and two of the earliest in the world. The previous human settlements we read about in *Prehistory* were all either temporary refuges, transitory camps or villages. The arrival, now, of the town or city marked a great change in the way people lived, and it is important to understand why.

We usually distinguish towns from villages by their size: a town contains a much larger number of people than a village. We also make a distinction on the basis of the inhabitants' occupations: a village consists mainly of those who live by agriculture or cattle-rearing; a town, mainly of those who follow non-agricultural crafts, and provide labour and services to other townsmen. A moment's reflection will show that this necessarily follows from the town simply being larger than the village. If a village, containing people who live by agriculture, grows larger, many of its inhabitants will have to till fields or take cattle to grazing grounds at very long distances from it, and the inconvenience will force them to move to a new village closer to their fields or pastures. A village purely based on agricultural or pastoral pursuits cannot, therefore, grow beyond a particular size. But for craftsmen there would be no difficulty in living in a large settlement, for they can still go on working in their homes. Indeed, the larger the settlement grows, the better it can supply them with customers and meet their needs from its markets and shops. The emergence of towns, which archaeologists initially recognize by the large area their remains cover, necessarily implies the presence of a considerable number of people who do not grow food for themselves, but work at crafts or perform services while subsisting on food produced mainly by villagers.

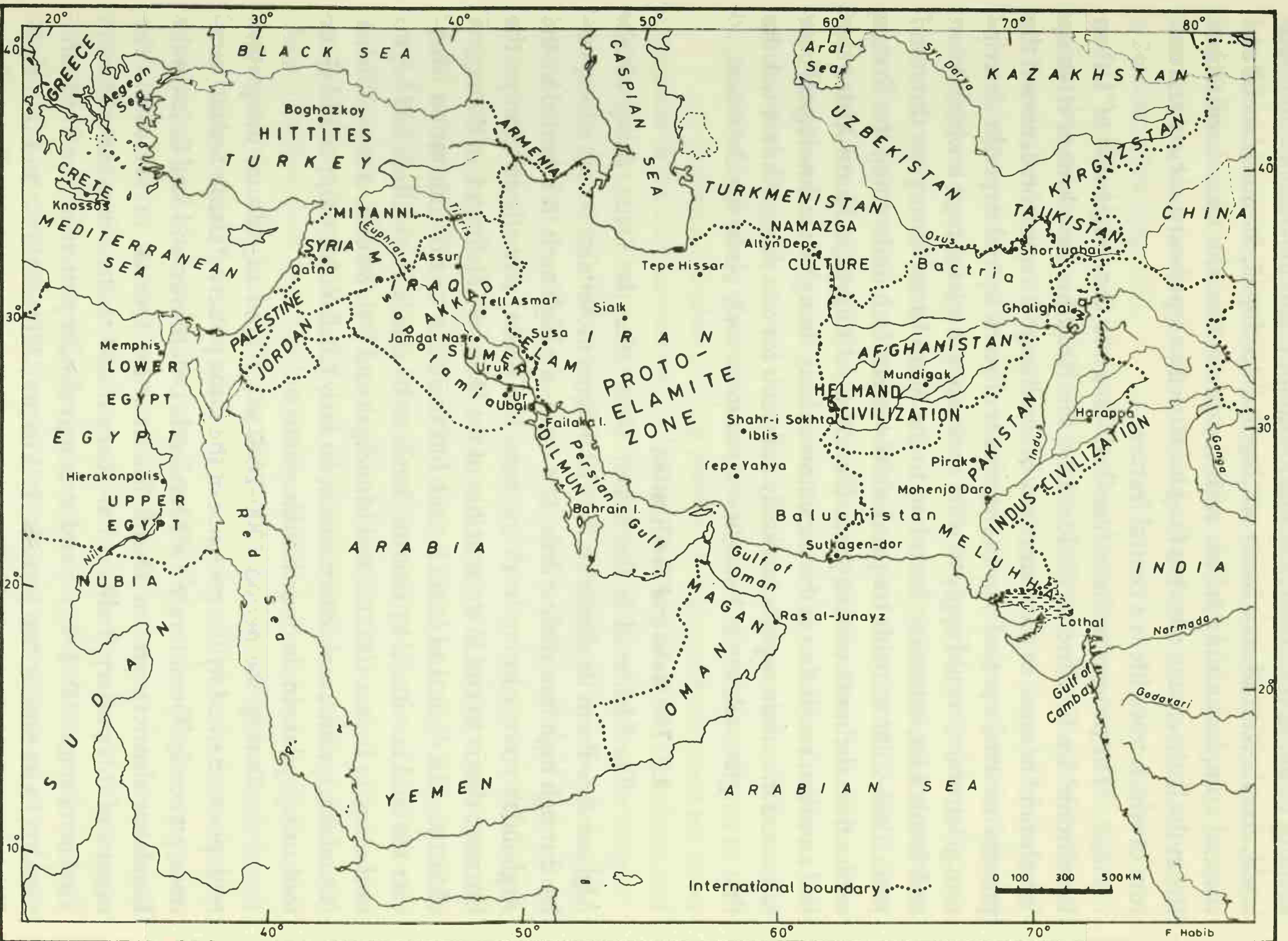
Such a situation could only be brought about when peasants grew more food than they needed for their own bare subsistence, or, in other words, produced a surplus. Such ability did not immediately come about when

agriculture first began to be practised during the 'Neolithic Revolution' (see *Prehistory*, Chapter 3.1). A further set of developments was necessary to increase agricultural production, for example: (1) additions to the inventory of crops cultivated, making it possible to obtain both food and 'industrial' crops; and (2) the use of castration (the first step in bio-engineering), which enabled oxen to be yoked to the plough and to the cart, thereby helping to till a much larger area with the same amount of manual labour and to transport by cart the surplus grain to the towns. On the other hand, the number of non-agricultural crafts and their practitioners multiplied because of a number of inventions: the spindle and the loom, the potter's wheel, the smelting of copper, the bow-drill, the cart-wheel, and fired or baked bricks. These inventions called for greater specialization of skills and so of a progressive division of labour in which one individual concentrated on a single craft. The craftsmen could obtain their means of subsistence by passing on their products by sale (often barter) to their customers, many of whom, being rulers, priests or wealthy merchants, lived in the towns.

The rulers of the area would find it convenient to live in citadels or forts in or near the towns for safety, and to meet their needs for weaponry, clothing, utensils, luxury articles, etc., from the towns' craftsmen. The town itself needed to be administered, and so the state's apparatus came into existence. But the state's machinery was also needed for securing the town's essential life-blood, viz. the supply of a part of the surplus from the countryside that was seized by the state as tribute or tax in the form of foodgrains and raw materials. Bronze weaponry greatly strengthened the city-based rulers against stone-using villagers. The villages were forced to pay tribute or tax in kind to the rulers, who then distributed the grain and other produce among their officials, retainers and servants. Part of the rural surplus would thus pass on to town merchants, labourers and artisans, as the rulers and their dependents bought their products and services.

We have, in reconstructing this picture, stressed the economic and political basis on which towns arose; but we must not forget the factors of ideology and superstition. Towns could also be centres of religious cults and places of pilgrimage. Temples dedicated to gods could rival rulers' palaces. Religious faith often bound people in allegiance to rulers, who might be priest-kings or even (as in Egypt) 'god-kings', closely allied with the priesthoods. By the nature of their occupation, the priests dealt with marks and symbols, representing deities, royalty and rituals. Special marks could also be put on goods to indicate ownership or identity of the producer. It is possibly out of such marks that some of the early systems of writing developed (see Note 2.1). It is

Map 1.1 Southwest Asia: Copper Age Cultu



difficult to visualize a state collecting large amounts of tribute from villages and disbursing it in towns without a regular system of taxation and account-keeping. There is, conversely, a strong presumption for the existence of priesthood, commerce and state, once writing had developed. So much social and cultural complexity thus arrives with the towns that the term 'civilization' (from the Latin *civitas*, city) has long been used to represent a society and culture of which town life is a central feature.

The process we have described was given the designation of 'Urban Revolution' by V. Gordon Childe. Like the Neolithic Revolution, it was a 'revolution' because of the immensity of the change it represented, even if the process involved a period of some hundreds of years. By and large, the description given above would apply to what took place in a large region within West and South Asia, extending from Iraq to the Indus basin, during the thousand years 3500–2500 BC, with Iraq and southwestern Iran undergoing the change earlier than the more eastern parts. (See *Map 1.1.*) Egypt in North Africa also had an urban revolution at the same time as Iraq, though its technological base remained in certain aspects markedly different: for one thing, while it was the first to employ sails for its boats, it did not in its early phase use the wheel.

1.2 The Helmand Civilization

The Helmand is the largest river, after the Oxus, rising within Afghanistan. From its source in the Hindukush mountains it cuts a long valley through high mountains; then, as it leaves the highlands, it is joined by the Arghandab river, coming from the east. The united river flows through the Garmser desert to end in the marshes of the Hamun-i Helmand, in the region of Sistan. The Helmand basin is arid; but there can be rich cultivation wherever the land is watered by riverine floods or by canals. Agriculture had begun in the region before 4000 BC, and Mundigak and Deh Morasi, near Kandahar (Qandahar), were rural settlements in an early Chalcolithic (copper and stone tool-using) phase in the fourth millennium BC.

During the period 3200–2600 BC, a kind of cultural integration took place, marked by the presence of the same pottery ('Damb Sadaat' ceramics, especially 'Quetta ware') at Mundigak, Deh Morasi and Said Qala (in the Kandahar district), and at Damb Sadaat (near Quetta, in Pakistan). The origins of this pottery tradition have been traced to the Namazga culture in Turkmenistan, 3600–3000 BC, and strikingly similar pottery is found at Shahr-i Sokhta in its earliest two periods (I: 'Archaic', 3200–2700 BC; and II: 'Proto-Urban', 2700–2500 BC), while disappearing during the third (III: 'Proto-State', 2500–2200 BC). Shahr-i Sokhta is situated in the Helmand delta (Sistan), just

inside Iran. It became one of the earliest cities of the world when, during the four centuries following 2800 BC, its inhabited area expanded from 15–17 hectares to about 150 hectares. Some 400 kilometres away, Mundigak in its Periods IV and V (2600–2100 BC) shows all the cultural traits of Shahr-i Sokhta, and its inhabited area too attained an extent of 55–60 hectares. With two such towns the Helmand culture attained the level of a civilization by *c.* 2600 BC. (See *Map 1.2.*)

The Helmand cities could have come into being only if the region's agriculture produced a sufficient amount of surplus. The major foodcrops were barley and wheat; ovens, hearths and grindstones found in houses at Shahr-i Sokhta show that bread was being made of these two cereals. Linseed was cultivated for perhaps both oil and flax, being thus an 'industrial' crop. The wide representation of the humped ox in clay figurines and the wooden part of a cart-yoke found at Shahr-i Sokhta suggest that the ox (bullock) was being used for draught purposes; if so, the plough too must have come into use. Grapes and melons were eaten, and these require careful cultivation with much water. Pastoral activity was also important: 90 per cent of the animal bones found in Shahr-i Sokhta are those of sheep, goats and cattle.

In Shahr-i Sokhta, around 2500 BC, the fast potter's wheel led to an expansion in pottery production, and 50 to 100 kilns have been found situated together in the city. Copper-smelting developed considerably; but the proportion of tin in bronze (alloy of copper and tin) at Mundigak was low, being just 1 per cent, so that bronze was not probably deliberately made. A socket-hole axe and adze of this metal have been found at Mundigak, datable to *c.* 2600 BC. The socket to hold the handle had appeared (to judge from clay models) in the Ubaid culture of Mesopotamia (*c.* 4000 BC), and then in Iran in metal at Susa I and Sialk III, before 3000 BC. It greatly enhanced the effectiveness of the axe; the delay in its diffusion further east of the Helmand basin into India remains a puzzle (see Chapters 2.3 and 3.2). Wooden spindles and whorls found at Shahr-i Sokhta show that hand-spinning could now be done faster (the spinning wheel was still three millennia away!). Wooden combs have been found for dressing human hair, but a large poplar comb could have been used only for separating warp threads; this, with a number of wooden pegs and a possible shuttle, implies weaving on the loom. The fibres woven were apparently flax and wool. Fine stone-cutting was still done by diverse stone tools ('microliths', including drills). Beads and other ornaments were made of lapis lazuli and turquoise (brought from distant mines), and of chalcedony, quartz and flint (of local extraction). Artisans worked in domestic workplaces scattered among the residential quarters in Shahr-i Sokhta, *c.* 2600 BC, though by

2100 BC their quarters appear to have been concentrated in particular portions of the town, occupying about 40 hectares in all.

Houses were built of unbaked mud-bricks which had a standard size (roughly 10 x 22 x 45 centimetres) throughout the main periods of occupation at Shahr-i Sokhta. Poplar trunks helped to provide roofing. Clay pipes joined together improved domestic drainage. Shahr-i Sokhta grew without much planning, however: its roads and lanes were throughout narrow and winding.

A notable feature of Shahr-i Sokhta is its graveyard, covering 21 hectares and containing an estimated 22,000 graves. The goods deposited with the dead help to show the extent of economic differentiation: rich men's graves were filled with as many as forty pots; the poor were buried with one or two pots only. Some of the better-off are also buried with lapis lazuli and cornelian beads. There is also the possibility of human sacrifice, with two or more persons buried at the same time: such sacrifice would imply the presence of slavery. The goods in craftsmen's graves show, however, that some of the craftsmen could have belonged to the middle-income groups.

The growth of wealth and trade may explain the use of signs or marks of ownership; and seals of stone (including lapis lazuli) and clay sealings, with various marks and decorative motifs, have been recovered from Shahr-i Sokhta and Mundigak. A clay tablet containing a line of Proto-Elamite characters (in use in southwestern Iran) from levels datable to 3200–2900 BC at Shahr-i Sokhta (*Figure 1.1*), as well as the early presence there of cylinder-seals, suggests that there was a colony of Proto-Elamite merchants at the town. The Helmand civilization, however, did not develop any writing system of its own.

There are certain indications that a state system had been established. The primary evidence consists of 'monumental architecture': the remains of two 'palaces' have been located at Shahr-i Sokhta; and a 'palace' (*Figure 1.2*) and a 'temple' (?), both with decorated facades of masonry, at Mundigak, in its Period IV, which also saw a city wall being built. Administrative authority is to be inferred from the way Shahr-i Sokhta graveyards were kept separate from the town or the way craftsmen's houses came to be confined to certain quarters of that town.

The territory of the state must have been large enough to extract sufficient surplus from the agricultural zone in order to sustain the towns. It is tempting, therefore, to regard the area of the Helmand civilization, which by 2600 BC was fairly homogeneous in nearly all aspects of culture, as being under

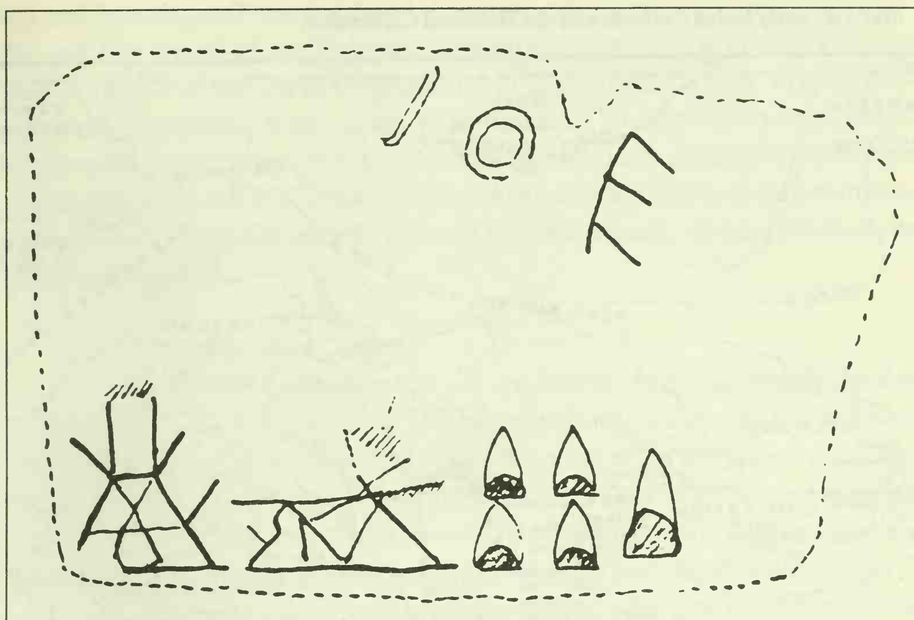
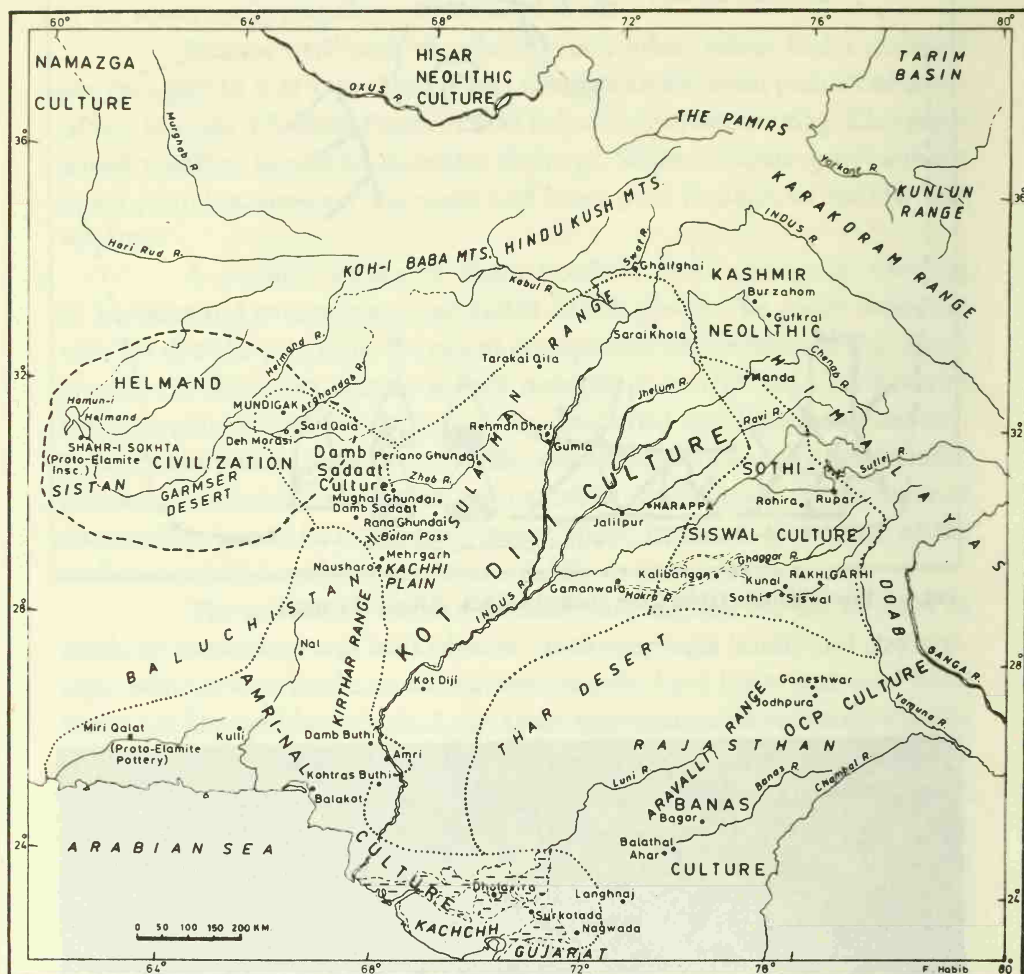


FIG. 1.1 Proto-Elamite tablet from Shahr-i Sokhta. (After P. Meriggi)



FIG. 1.2 Palace at Mundigak. (After J.-M. Casal)

Map 1.2 Early Indus Cultures and the Helmand Civilization



a single state, with Shahr-i Sokhta as the capital and Mundigak as a subordinate seat of power. With the rise of the state, there also came war, and the suffering it brings. Before its Period IV (2600–2400 BC), during which Mundigak adopted the culture of Shahr-i Sokhta, there was widespread destruction; Period IV itself was closed, *c.* 2400 BC, by another round of destruction. After a temporary abandonment Mundigak was resettled, with a new style of pottery, though still within the Helmand tradition. The resettlement was marked by the construction of a 'massive monument', presumably the seat of a new political authority.

The Helmand civilization came to an end before 2100 BC, by which time the urban phases at both Shahr-i Sokhta (Periods II and III, 2700–2200

BC) and Mundigak (Periods IV and V, ending *c.* 2100 BC) were over. The middle and late phases of the Helmand civilization coincided with the early and middle phases of the Indus civilization, but it is surprising that, despite geographical proximity, there is no firm evidence of any direct interaction between the two cultures. Nevertheless, in the Helmand civilization we have a model of how an urban society could develop out of agricultural communities. We now turn to similar communities in the Indus basin, which preceded the Indus civilization.

1.3 Early Indus Cultures

In *Prehistory*, Chapter 3.3, we saw how in a period roughly datable to 3800–3200 BC, we can identify two mainly Neolithic cultures in the Indus basin, one marked by the so-called Kechi Beg pottery, in the region of north-eastern Baluchistan and southern NWFP (North Western Frontier Province); and the other by the so-called Hakra ware, in the Punjab within Pakistan. These were agricultural and pastoral communities, with small settlements.

Although carbon dates give a very broad time-bracket, it seems that around 3200 BC, there was a substantive change with the appearance of three cultures together covering the entire Indus basin. These are identified by their distinct pottery styles, named after their type-sites (that is, sites where the pottery was first recognized): (1) The Kot-Diji culture, containing the largest area, embracing NWFP, Pakistan's Punjab and northern Sindh; (2) the Sothi-Siswal culture, with settlements in northern Rajasthan, India's Punjab and Haryana; and (3) the Amri-Nal culture, found in Baluchistan and central and southern Sindh, with extensions in Gujarat. (See *Map 1.2.*) The three cultures belong to the same period, *c.* 3200–2600 BC, though the Kot-Diji culture in its north-western territory continued an independent existence till after 2000 BC. (A fourth culture, named after its type-site, Kulli, in south-central Baluchistan, previously thought to be earlier, is now assigned to the period of the Indus civilization, 2600–2000 BC.) The Damb Sadaat culture is treated by some scholars as an Early Indus culture; but it seems to belong more to the Helmand region (see above, 1.2).

Despite the different pottery traditions, the three Early Indus cultures had many features in common. First, there was a notable advance in agriculture, with the conversion of the ox into a draught animal (possible only by use of castration). The discovery of cart-ruts in the pre-Indus levels at Harappa is to be placed alongside that of cart-wheels, cart-frames and bulls in terracotta models at Jalilpur in west Punjab (Kot-Diji period). The use of the two-wheel ox-cart in the Indus basin is therefore probably not much later than

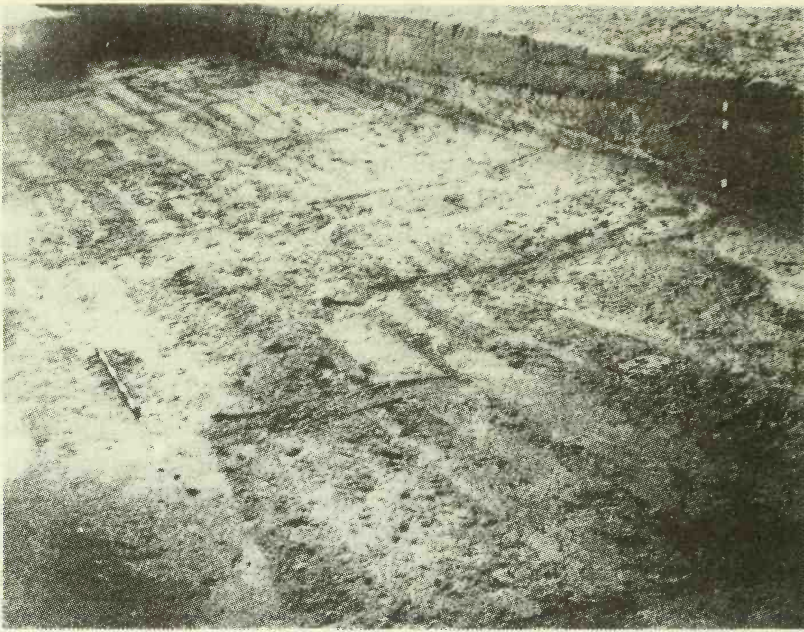


FIG. 1.3 Ploughed field, Kalibangan. (Archaeological Survey of India)

the wheeled wagon (four-wheel cart) attested in pictographs at Uruk in Iraq before 3000 BC. As we have already noted, once the ox is used to pull a cart, it is almost certain that it was also being used to draw the plough. There has, indeed, been found at Kalibangan (northern Rajasthan) a field with straight furrows, parts of which partly lie below some Mature Indus debris, leading the excavators to assign it to the Early Indus period. (The quite modern appearance of the furrows, with evenly spaced cross-furrows suggestive of an additional crop being sown, is, however, rather perplexing. See *Figure 1.3.*) The new use of the ox was not seemingly adopted everywhere. At Balakot (southeast Baluchistan), in its Amri-Nal phase, the oxen were slaught-ered early, so that they could not have worked as draught animals; at Jalilpur, in its Kot-Diji phase, on the other hand, the oxen generally attained their full size before slaughter, and so must have been used for work. The plough greatly lessened the labour of peasants previously performing the same task manually with the hoe, and also enabled the same family to till a much larger area of land (probably double, to judge from studies of such change in contemporary sub-Saharan Africa). It accordingly brought about a substantial increase in yield per head of population.

We may remember (*Prehistory*, Chapter 3.2) that barley and wheat had begun to be cultivated at Mehrgarh in the plains below Quetta; and these

crops are found in the Early Indus period also at Rehman Dheri and Kalibangan. Both of these are 'rabi', or winter crops. Sorghum millet ('jowar'), a 'kharif' or summer crop, reported from the Sothi-Siswal site of Rohira (in the Punjab) needs to be confirmed, since there is no other evidence of this crop in the Indus basin proper, before 2000 BC. One can presume that cotton, attested before 4000 BC at Mehrgarh, continued to be grown, though there is no direct evidence for it in this period. A species of vetches is attested from Balakot (Amri-Nal phase), and the date fruit and grape from Rohira. Ovens, including tandoors, have been found at Kalibangan (Early Indus phase), taking the history of bread-making in India back to nearly 5,000 years ago.

The spread of the use of the vertical wheel, and therefore of the cart, was a momentous event, for it made heavy transport possible in the plains. Moreover, the castrated ox could also do duty as a pack animal. Indeed, before the railways, the Banjaras with their large herds of pack-oxen used to transport enormous quantities of foodgrains, salt and other goods of bulk.

Pottery was the most visible craft product, and wheel-made pottery dominates in all the three Early Indus cultures. The stone was the chief material for tools, chert flakes and blades comprising the bulk of the normal toolkit, with some bone tools thrown in. At Kot-Diji were manufactured fine blades made of flint from the neighbouring Rohri or Sukkur hills in northern Sindh. But the technology was now firmly Chalcolithic (that is, using both stone and copper), and the progress in copper-smelting is shown by the remains of a workshop at Nal (Baluchistan). The more precious metals were also worked to provide ornaments. At Kunal (Haryana), a number of silver and gold ornaments have been found possibly belonging to the Sothi-Siswal phase. At the same site, a hoard of as many as 12,000 beads of cornelian, agate, lapis lazuli, and steatite and shell were found as well; and both Nal and Kalibangan (Early Indus phase) have yielded beads of these materials, which could only have reached all the three places through long-distance trade. Some of the artefacts, like the ivory

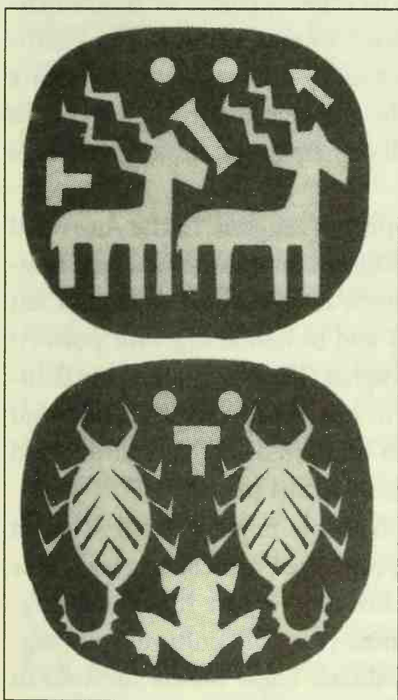


FIG. 1.4 Pendant from Rehman Dheri. (After F.A. Durrani)

pendant from Rehman Dheri (*Figure 1.4*), show a high level of art.

These advances in economic activity helps to explain the much larger number of settlements, of larger size and more permanent nature than those of the preceding Hakra Ware culture in the Punjab (see *Prehistory*, Chapter 3.3). Mud-bricks were universally employed to build houses, with stone sometimes used, whenever locally available, in foundations and in lower levels of walls. Except for a rare occurrence at Kalibangan in its Early Indus phase, the use of fired bricks is entirely absent. The estimated size of Harappa, in its Kot-Diji levels, is 40 hectares, and a similar size has been claimed for Rakhigarhi, a Sothi-Siswal site in Haryana. Possehl estimates that based on the size of 291 Early Indus sites, the average size was 4.5 hectares, while thirty-four settlements exceed 10 hectares in individual size. The Urban Revolution had not yet arrived, but some settlements were certainly getting close to being small townships.

Yet, the extent of social differentiation was rather limited. Seals, which may be seen as symbols of ownership claims, are rather rare, though six small stone seals have been reported from Kunal, in what have been held to be late Early Indus levels, as well as some small terracotta seals from Nausharo. Large houses too are rare. Anything that can be called a palace or monumental building, one that could be a ruler's residence or seat has not been identified. Defensive walls, which are most likely to have been the work of rulers, are found at Kot-Diji, Kalibangan, Kohtras Buthi (western Sindh) and Rehman Dheri. But the impression one gets is of small principalities, rather than large powerful states.

Funerary rites are an important aspect of religion. In the Amri-Nal culture area, at Nal and Damb Buthi in Baluchistan and Surkotada and Nagwada in Gujarat, we find fractional burials, which show that the dead were left exposed, and later their bones were collected and buried along with pots. At the Kot-Diji sites of Periano Ghundai and Mughal Ghundai (northeast Baluchistan), on the other hand, the dead seem to have been cremated first and then their bones collected and put in pots to be buried. No straightforward extended burial is firmly attributable to the Early Indus period.

Pottery decorations and terracotta figurines might also tell us about the people's beliefs. Parallel to the bull portrayed in the Damb Sadaat ware (see above, 1.2), is the horned deity on a pot from Kot-Diji (*Figure 1.5*). Female figurines in clay at Jalilpur, Gumla and Sarai Khola (Kot-Diji culture sites) suggest the worship of some form of Mother Goddess. These beliefs survived in the religion of the succeeding Indus civilization, but it is also true that neither the funerary rituals of the Indus civilization nor most of its deities (of human

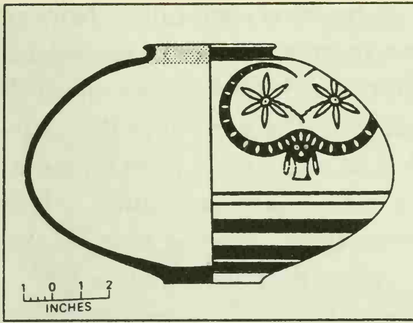


FIG. 1.5 Horned deity on Kot-Diji pot. (After A. Parpola)

or animal shape) can be traced to any of the Early Indus cultures.

There is no evidence of writing. Potters' marks found in the Amri-Nal strata of Balakot and at the Kot-Diji site of Rehman Dheri may signify either individual artisans' marks or ritualistic symbols. Significantly, the Balakot and Rehman Dheri marks do not match well, and the relationship of either to the Indus script is debatable.

Of the three Early Indus cultures we are considering here (Kot-Diji, Sothi-Siswal and Amri-Nal), only the Kot-Diji culture survived the onset of the Indus civilization in a substantial area covering much of NWFP and northwestern Punjab. At sites such as Rehman Dheri, Gumla and Tarakai Qila in NWFP, and Sarai Khola in northwestern Punjab, we have remains of this phase (*c.* 2600–2000 BC), largely corresponding to the period of the Indus civilization. While showing some influence of the Indus civilization, they do not have any of its characteristic features, viz. writing, baked brick, distinctive pottery, etc. Numerous small Sothi-Siswal villages in the Ghaggar valley also seem to have existed in the Mature Indus period, while in central Baluchistan a local culture named after the type-site Kulli established itself on the periphery of the Indus civilization.

1.4 Onset of the Indus Civilization

Harappa, in Sahiwal district of west Punjab, Pakistan, had long been known to archaeologists as an extensive site on the Ravi river, but its true significance as a major city of an early great civilization remained unrecognized until the discovery of Mohenjo Daro near the banks of the Indus, in the Larkana district of Sindh, by R.D. Banerji in 1922. Sir John Marshall, then Director General of the Archaeological Survey of India, used the term 'Indus civilization' for the culture discovered at Harappa and Mohenjo Daro, a term doubly apt because of the geographical context implied in the name 'Indus' and the presence of cities implied in the word 'civilization'. Others, notably the Archaeological Survey of India after Independence, have preferred to call it 'Harappan', or 'Mature Harappan', taking Harappa to be its type-site. There is little justification for the name Sarasvati-Sindhu, recently coined to arbitrarily impose a Vedic complexion on the culture. The Indus basin includes the area along the Sarasvati, a small seasonal river, so that the coupling of

Sarasvati with the Indus ('Sindhu') has no geographical justification. Nor can such justification be provided by the relatively large number of settlements found in the vicinity of the dried-up channels of the Hakra, Ghaggar (of which the Sarasvati is a minor tributary) and Chautang. The survival of the settlements in this area is obviously due to the lack of interference from floods (as the rivers were small even when flowing) and from later cultivation (which retreated as the rivers dried up, leaving the sites alone). Thus we have here no real proof that the Ghaggar-Hakra valley was either the most populous area or the core zone of the Indus civilization.

Harappa and Mohenjo Daro produced the basic cultural markers by which other settlements subsequently found could be identified as belonging to the Indus (or the 'Mature Indus') civilization. These defining features can be listed as follows:

1. Wheel-made pottery of a distinctive kind: baked to a red colour, thick-walled, heavy, sometimes coated with red slip. Some pots were painted black; and there were certain popular motifs painted in black on the pottery, such as the pipal leaf, intersecting circles and the peacock.

2. The Indus script, especially appearing on seals, with characters that show practically no regional variations.

3. Baked bricks, as well as sun-dried mud-bricks of standard size, with sides in the ratio of 1:2:4.

4. Standard weights, based apparently on a unit of 13.63 grams.

5. A tendency to lay out straight roads (meeting others at right angles) in urban and semi-urban settlements, and to pay considerable attention to drainage.

6. Citadels built adjacent to, but separate from, the towns.

7. Masonry wells and tanks.

8. Burying the dead, laid supine, aligned north–south, usually in out-of-town cemeteries.

Naturally, all these features are not to be expected at every settlement, especially those that were small or which have not seen any excavation. Pottery and bricks are perhaps the most easily noticeable markers.

The settlements belonging to the Indus civilization are found in a single contiguous zone extending over the Pakistan plains and parts of Baluchistan, the Indian states of Punjab, Haryana, northwestern Uttar Pradesh, northern Rajasthan and Gujarat (see Chapter 2.1).

The accumulations of dust, waste and debris have considerably raised the levels of habitation, the process being especially observable at Mohenjo Daro, where a rise of 7 metres could have taken place as may be seen

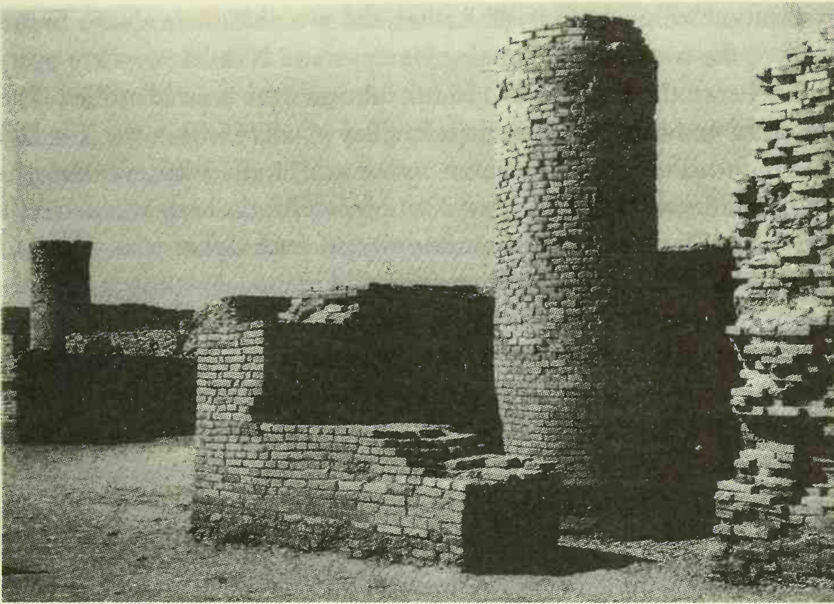


FIG. 1.6 Rising wells at Mohenjo Daro. (After M. Jansen)

from the heights to which the well openings had to be raised above the original ground level (*Figure 1.6*). Since such accumulations take place slowly, it has been inferred that the Indus civilization must have had a life-span of at least 500 years. The numerous carbon dates available to us from various sites confirm the longevity but do not provide such precise limits in time as we may wish for, there being many contradictions and overlaps between dates for the Early and Mature Indus periods. The best solution is to assign to the Indus civilization a period in which most carbon dates are concentrated: roughly 2500–2000 BC. We can take the century preceding 2500 BC as a period of 'transition', when the civilization spread from its core area to all the other parts. The period for the Indus civilization so determined has also the virtue of synchronizing with the dates derived from the Indus material (notably etched cornelian beads and seals and sealings) that has been found in Mesopotamia, where the chronology is more reliably fixed by written material supplemented by carbon-dating.

The practically simultaneous appearance of the Indus civilization over such a large area and its very great uniformity in cultural features show that the civilization could not have originated spontaneously in its different regions, but must have diffused from a smaller core area. What area this was cannot today be determined, because at no excavated site do we get firm evidence of an Early Indus culture having produced the main features of the

Indus civilization from within itself. Rather, the two phases are always found to be distinct, the two exceptions being Harappa and Nausharo, where overlap phases between the Kot-Diji and Indus cultures have been identified. The core area of the Indus civilization, therefore, lay possibly within the Kot-Diji culture area in the Punjab and northern and central Sindh. Whatever the area of origin, the diffusion of the Indus civilization could have been attained only by means of political expansion: uniformity in such spheres as units of measures, town-planning and writing is not likely to have arisen spontaneously everywhere. One must imagine that the proto-Indus state, by use, perhaps, of ox-drawn chariots and bronze weaponry, subdued the territories of the different Early Indus cultures, and thereafter imposed its major features of economic and cultural life in all parts of the 'Indus empire', which was now formed. One need not, however, insist that such an 'empire' necessarily maintained its existence for the whole lifetime of the Indus civilization: it could conceivably have broken up into regional states which separately maintained the institutions and customs installed by the original conquerors (see Chapter 2.7). Whatever the details of the process, the role of the state in the spread of the Indus civilization is likely to have been crucial.

Although we do not know exactly where in the Indus basin the original seat of the Indus state was located, a further question must still be asked: how did the several elements making up the Indus civilization gather there? Since in practically all these elements, such as the city, state, seals, writing, fired bricks and ox-haulage, Mesopotamia (Iraq) has precedence in time over the Indus basin, the question of diffusion from Mesopotamia has been

TABLE 1.1 Chronology of Early Indus and Helmand Cultures

BC	
3200–2700	Shahr-i Sokhta, 'Archaic' phase
3200–2600	Damb Sadaat or Quetta Ware culture
3200–2600	Early Indus cultures: Kot-Diji, Sothi-Siswal and Amri-Nal
3000–2600	Plough and cart in the northern parts of the Indus basin
2700–2100	Helmand civilization
2600	Socketed axe and adze, Mundigak
2600–2500	Onset of the Indus civilization
2600–2000	Late Kot-Diji culture, northwest Pakistan, and Kulli culture, Baluchistan
2500–2000	Indus civilization, 'Mature' period

Note: All dates are approximate, and have been mainly determined by taking into account concentrations of ^{14}C dates, and reducing overlaps between different ^{14}C dates.

raised quite often. There is, however, little evidence of early direct contacts (that is, before 2600 BC) between the two regions. There is also no similarity between the scripts of Iraq and the Indus civilization. Even Proto-Elamite influences perceptible in the early phases of the Helmand civilization are not traceable in any of the Early Indus cultures. It would, therefore, seem that while indirect technological diffusion and cultural influences from Mesopotamia cannot be ruled out, the Indus civilization, in its essential features, had probably largely indigenous origins.

Note 1.1
The Methods of Archaeology

Archaeology may be defined as the science that deals with the physical remains pertaining to past human societies. These remains include plants and animals (wild and domesticated), evidence about other aspects of the natural environment (climate, river courses, floods, etc.), structures that the humans built (huts and houses), the articles they made ('artefacts') and their own skeletal remains. For the period of this monograph and of the previous one (*Prehistory*), archaeology forms practically the sole source of information, since we have no written materials of the time to help us; and when these do become available in the form of the Indus characters we are not able to read them (see Note 2.1). It may, therefore, be helpful to provide some elementary particulars of the methods by which the archaeologists get their data, and the terms they frequently use.

The two principal methods in field archaeology are exploration and excavation.

Exploration involves observation only, without disturbing the physical remains themselves. Sites of old settlements can be located by sight by several means. Artefacts, notably pottery, and the bricks or other traces of old structures may be found on the surface. Or the settlements may be marked by earthen mounds ('tells'). Continuous habitation for long periods raises the habitational level much above the general ground level, and the accumulations of dust and habitational materials get finally covered by wind-blown dust so as to assume the appearance of a hillock or mound. Sections of such mounds are exposed as rain-water cuts through their slopes, and such erosions enable the archaeologist to see successive 'strata' or cultural levels, and also pick up artefacts of various periods of habitation. Similar mound-faces or 'sections' may be exposed by human action, such as when peasants cut into a mound to extend their fields or when there is a cut made for a road.

Old walls and ditches as they fall down or fill up can be traced through ground irregularities. Sometimes such irregularities are hard to notice when the observer stands on the ground. *Aerial photography* is a great help here: photographs taken from a plane or a balloon in the morning or evening (when the shadows cast are long) show up features of relief (bumps and hollows) that one may otherwise wholly

miss. A similar purpose, for smaller areas, is served by rigorous ground survey. Taking a particular spot to represent the base level (=zero), one may measure the area of the site and establish the heights above the zero level and, on their basis, draw contours (or elevation lines) on a plan or map. This would enable one to trace the remains of walls, roads, habitational places, ditches, etc. *Geophysical surveying*, though expensive and time-consuming, enables one to explore what lies below the ground. A magneto meter may help to mark the presence of a buried metal tool or hearth; a resistivity meter can similarly indicate a filled pit or buried wall. How much can be achieved by exploration by air, ground and geophysical survey has been shown by a combined German–Italian project at Mohenjo Daro in 1982–83.

Excavation or digging involves a deliberate disturbance of the physical remains in order to collect artefacts and other objects, and to study more closely the stratification, structures, etc. Excavation may be either 'vertical' or 'horizontal'.

Vertical excavation generally covers a small area, and the excavators remove the artefacts and, if necessary, cut through fixed features of one stratum to reach those of another. Often a 'sondage', or test trench, is dug, mainly to establish the sequence of cultures ('stratification'). The sides ('sections') of a trench, whenever exposed or scraped, can show the sequence of the strata, often marked by different colourations of the earth. It may be noted that while the layers distinguished upon digging are numbered in Arabic numerals, as 1, 2, 3, ..., while the excavator proceeds

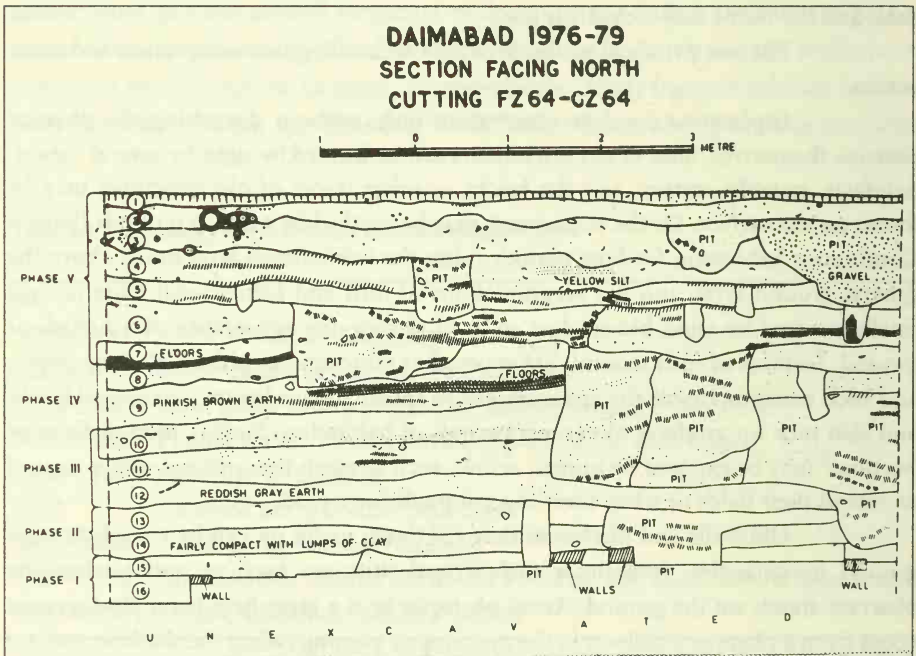


FIG. 1.7 **Stratified section, Daimabad.** (After S.A. Sali)

downwards, it is the reverse with the cultural phases or 'periods', where the lower, that is, earlier, phase or period is assigned a lower number in Latin numerals. The excavator aims to reach the virgin soil: the lowest layers that bear any signs of human occupation and belong to the earliest cultural phase, are assigned to Phase or Period I. The other 'periods' comprising sets of different layers that his spade has already uncovered would be numbered II, III, IV, etc., going upwards. Thus we can now assume that, say, Daimabad III must be later than Daimabad I (*Figure 1.7*).

Horizontal excavation normally covers a much larger area, and is usually designed to expose the structural remains and settlement pattern of a particular time or stratum. Mohenjo Daro offers the classical instance of a horizontal excavation, even though only a portion of the city has been excavated. Vertical excavation could never have exposed the layout of the roads and houses in the manner the horizontal excavation has done.

Whether the excavation is vertical or horizontal, much care still needs to be exercised while digging. Careless digging can destroy valuable evidence for ever. For a long time, till the early twentieth century, excavators tended to clear everything away until they came across stone and baked-brick masonry. Mortimer Wheeler, who headed the Archaeological Survey of India (1944–48), introduced more refined methods of excavation which took care of such features as rammed earth and mud-built structures, and different layers of soil, often to be distinguished only at first exposure. Excavators must not only avoid harming any buried artefact but also avoid mixing up different strata. The smallest things, like bone fragments or seeds, need to be retrieved. These may be recovered by simple sieving, or by *flotation*. This last requires that samples of soil excavated from a particular layer be put into a small water tank, into which air is pumped so that the lighter material, like bone fragments and seeds, are set afloat and come to the surface, to be collected for analysis. It is extremely important that the position of the different objects at the moment of recovery is noted both by strict three-dimensional measurement and by their *context*, that is, in relationship to other objects, as well as the layer in which they were found. Photography should be freely used during excavations, in order to show important objects *in situ* (in the original position).

Excavation must be accompanied by close scientific scrutiny of the excavated materials. The *typology* needs first to be determined, that is, the artefacts should be assigned to, and compared with, types already established from finds from other sites: this is essential for discovering whether any relationship exists with any other culture or cultures. Pottery often provides the primary material for comparison, since it is generally pottery that is most extensively found at archaeological sites. Broken pieces of pottery are called 'potsherds'. Suitable objects (organic material and fired pottery, for example) should be sent for dating by ^{14}Carbon method and/or thermoluminescence to laboratories with full technical details. Similarly, *archaeo-botany*, the study of plant remains, especially grains or seeds, as well as pollens (whose study is called *palynology*), can tell us not only about the wild grains collected or the crops

grown but also about the environment. The ratios between tree pollens (TPs) and non-tree pollens (NTPs), for example, can be of help in establishing the nature of land-use at the time (forest, pasture or cultivated land). Animal remains have similarly to be studied, especially owing to their importance for both the subsistence economy and the natural environment. Domestication alters body-size and the shape of certain bones, which enables bones of domesticated animals to be distinguished from the wild of the same species. Thus, *archaeo-zoology* can shed much light on the development of human control over other animals.

It should not be expected that the excavator's word is always to be taken on trust. Ideally, the full original record in one form or another should be made available to other researchers. It is also important that reports on excavated sites be published within a reasonable time. These reports should describe the site and finds in detail with maps, photographs, drawings and diagrams, and provide scientific analyses of the excavated material.

What we have described up till now is mainly fieldwork. The *interpretation* of the data collected from such fieldwork (and laboratory analyses) is also a very important part of archaeology: we need to gather individual pieces of evidence on related matters and construct a larger picture by filling the gaps through use of analogy and logical inference. The analogies can often be drawn most richly from what we know of societies through history (that is, the past as reconstructed from written sources) or through anthropology (which includes the study of still existing primitive societies).

When archaeologists work back from history to prehistory, they start from the most ancient societies illuminated by written sources (such as ancient Mesopotamia and Egypt), and explore the existence, origins or evolution of analogous features in societies known to us only from archaeological remains. One thus looks in prehistory for events and processes occurring as they have occurred in history, whether they be inventions and the diffusion of techniques, the growth of class-differentiation, state formation, human migrations, or changes in languages spoken or in religious beliefs and customs. A major practitioner of this method was V. Gordon Childe (1892–1957).

From the late 1960s, the validity of this approach began to be questioned by the proponents of 'New' or 'Processual' archaeology. (Notable among these was Lewis Binford, an American archaeologist.) Drawing their inspiration chiefly from North American anthropology, they insist that in prehistory one should not look for 'events' (rapid transformations) but only 'processes' (long-term changes). Moreover, they hold autonomous 'adaptation' to their environments by local societies to have been the norm in prehistory, so much so that the very term 'diffusion' came to be regarded with suspicion. There was inevitably a definite inclination to exclude external factors altogether from explanations of cultural change.

In more recent years, the incluence of 'New' archaeology has perceptibly declined. The major reason for its waning popularity seems to be that with more reli-

able chronology and the expansion of archaeological data, it has become abvious that both 'events' (notable occurrences, phases of rapid change) and 'diffusion' (the spread of techniques, languages or ideas) have their due place in prehistory. In any case, we must always bear in mind the fact that every archaeological hypothesis or preliminary assumption, whether based on history or anthropology, has to be tested by a very exacting scrutiny of evidence; and it is in this manner only that our understanding of the past grows.

Note 1.2
Bibliographical Note

The classical exposition of the concept of Urban Revolution will be found in V. Gordon Childe, *Man Makes Himself*, London, 1936, Chapter VII, and *What Happened in History*, Harmondsworth, 1942, Chapter V. (Both books have appeared in many subsequent reprints and editions.) Despite the passage of time, many of Childe's basic propositions retain their validity and are receiving fresh attention, after a phase in which he was much criticized for 'diffusionism'. (See Note 1.1.)

There is, unfortunately, no single important monograph on the Helmand civilization. M. Tosi *et al.*, in *History of Civilizations of Central Asia*, edited by A.H. Dani and V.M. Masson, UNESCO, Paris, 1992, Volume I, Chapter 9, offer a good survey. There are also papers in the journal *East and West*, Rome, New Series, Vols 23, 26 and 28; and in *South Asian Archaeology*, 1977, 1979 and 1981 volumes, which may be consulted.

On the Early Indus cultures, the main treasurehouse of data is Gregory L. Possehl, *The Indus Age: The Beginnings*, New Delhi, 1999. For a competent updated summary, see B.B. Lal, *The Earliest Civilization of South Asia*, New Delhi, 1997, Chapter IV. On the most extensive of the Early Indus cultures (Kot-Diji), Rafique Mughal wrote a pioneering work, 'The Early Harappan Period in the Greater Indus Valley and Baluchistan', Ph.D. dissertation, University of Pennsylvania, 1970 (widely available in mimeographed form). Suraj Bhan describes his explorations of Sothi-Siswal culture sites in his *Excavations at Mitathal (1968) and Other Explorations in the Sutlej–Yamuna Divide*, Kurukshetra, 1975. On the important site of Balakot in the zone of Amri-Nal culture, see papers by George F. Dales and others in *South Asian Archaeology*, 1977 volume, pp. 241–344.

The chronological table is based largely, but not entirely, on the scheme adopted by Possehl in *The Indus Age: The Beginnings.*

There are many textbooks on archaeology. Mortimer Wheeler's *Archaeology from the Earth*, Oxford, 1954, is one of the classics; Kevin Greene's *Archaeology, an Introduction*, New Jersey, 1983, is a more recent exposition of archaeological practice.

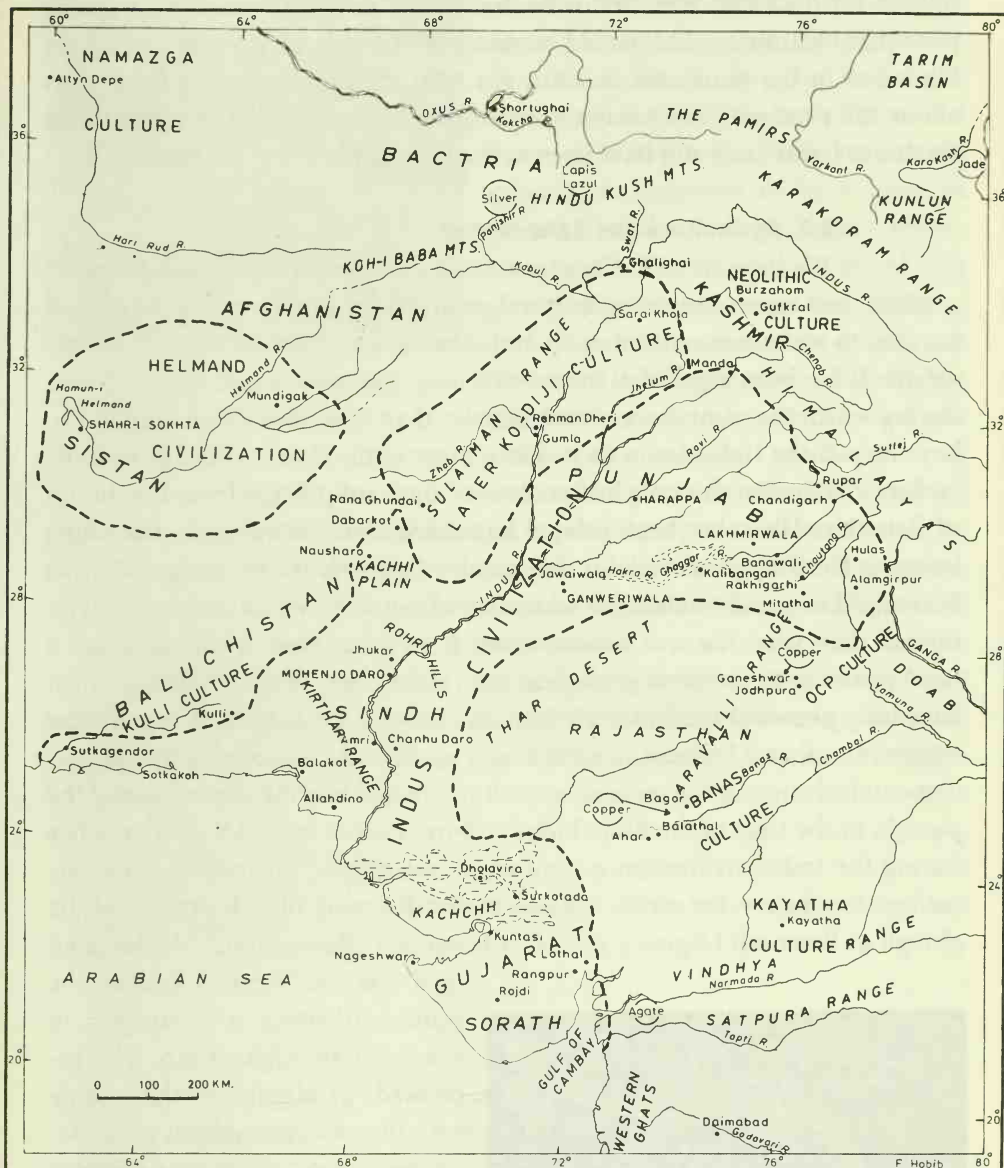
2
The Indus Civilization

2.1 Extent and Population

We have already touched (in Chapter 1.4) on the large extent of the Indus civilization. In terms of modern territorial boundaries, it covered most of the Punjab (in both the Indian Union and Pakistan), Haryana, parts of western Uttar Pradesh and northern Rajasthan, Sindh, most of Gujarat and parts of northeastern and southern Baluchistan. It was essentially a culture of the plains, reaching, but never crossing, the line of sub-Himalayan foothills marked by the sites of Manda (in Jammu and Kashmir), and Rupar and Chandigarh (in the Punjab). Nor is there any trace of an Indus civilization site in the Salt range in northwestern Punjab or in the trans-Indus hills of NWFP (North Western Frontier Province), where the Kot-Diji culture continued to flourish. Periano Ghundai in the Zhob valley in the Sulaiman range in northeastern Baluchistan seems a solitary outpost; but there are settlements in the plains of Baluchistan below the Bolan pass, including Dabarkot, just above the plateau wall. The civilization pierced the hills of eastern and southern Baluchistan up to Sutkagen-dor on the Dasht river near Pakistan's frontier with Iran. Southeast of Sindh, the Great Rann of Kachchh (Cutch) does not seem to have posed a barrier: Kachchh is studded with Mature Indus sites; and there are settlements in Gujarat from Nageshwar on the northwestern tip of Saurashtra to Lothal, near Khambhat. Well beyond these limits, there was an Indus trading outpost on the Oxus, at Shortughai in northeastern Afghanistan. (See *Map 2.1.*)

The number of inhabitants that this large area (nearly 700,000 square kilometres) contained has been variously estimated, the estimates ranging from one to five million. Perhaps, it is more reasonable to set it at a point somewhere midway. Given a total of about 150,000 persons assignable to Mohenjo Daro and Harappa together, the total urban population could not have been less than 250,000, bearing in mind the fact that large urban sites like Ganweriwala in Bahawalpur and Lakhmirwala in the Indian Punjab still

MAP 2.1 The Indus Civilization



remain unexcavated. At the height of de-urbanization in India during the nineteenth century, the rural population was nearly nine times the urban. With a much lower level of agricultural productivity than in the nineteenth century, it will be difficult to assume that sufficient food for the urban population was grown in the Indus civilization by a rural population less than

fifteen times its number. Such a ratio would give a total population of four million for the entire territory of the Indus civilization, or nearly six persons per square kilometre. This would compare with nearly 50 persons per square kilometre in the same area in 1901. (In 1991 the corresponding figure was about 180 persons!) The comparison helps us to see how sparsely populated the Indus basin must still have been at the time of the Indus civilization.

2.2 Agriculture and Subsistence

We have seen (in Chapter 1.1) that the Urban Revolution required a substantial expansion of agricultural production. The factors which could have led to such an expansion in the Indus basin have been the subject of some debate. It has been urged that there was a long 'wet' phase, *c.* 5510 to 2230 BC, during which the rainfall was much heavier than now; and this is thought to have helped the Indus basin to produce more grain than it could have done earlier or later. But this conclusion, derived by Gurdip Singh from his studies of Rajasthan lakes, has been refuted by subsequent researches on the saline basins in the Thar desert, and is also inconsistent with the drainage system at Mohenjo Daro and Kalibangan which could not have withstood any heavier rainfall than what the area now receives. If an 'arid' phase really followed a 'wet' phase in the present geological age (Holocene), then the change must have long preceded the Indus civilization (see also 2.8 below). A much safer explanation for an increase in agricultural production is provided by the fundamental advance in the tools of agriculture, marked by the appearance of the plough, in the time of the Early Indus cultures (see Chapter 1.3). Its presence during the Indus civilization is confirmed not only by the evidence for ox-haulage (see below, for carts), but also by the discovery of a clay model of the plough at Banawali (*Figure 2.1*) and at Jawaiwala (Bahawalpur). A ploughed field has also been found at the Indus settlement at Shortughai in northeastern Afghanistan. The increased productivity that came with the plough need not be stressed here once again (see Chapter 1.3). Harvesting tools (simple stone blades) were still poor, for it is not likely that copper sickles, being expensive, were widely used.

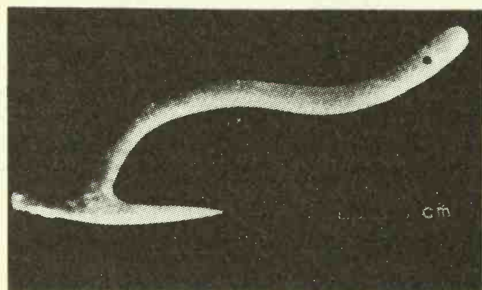


FIG. 2.1 Terracotta plough (toy), Banawali. (After R.S. Bisht)

The Indus civilization is the first



FIG. 2.2 The well at the Great Bath, Mohenjo Daro. (After M. Jansen) See also Figure 1.6.

culture known where access to underground water was secured by wells (see *Figures 1.6* and *2.2*). One need not doubt that 'cutcha' wells were dug in the villages; and at Allahdino (near Karachi) a stone-masonry well, built on higher ground, is supposed to have been so placed in order to help irrigate lower-lying fields. But there is no proof that the pulley was in use; and without pulley-and-rope the oxen could not have been used to lift water for field irrigation. On rivers, lakes and bunded reservoirs, the lever-lift based on stone counterweights ('shaduf', 'dhenkli') could have been in use, since the device is possibly represented on a seal from Mohenjo Daro. A canal built by Indus people has been traced near Shortughai, drawing water from Kokcha river; there is, therefore, some likelihood that similar canals were excavated in the Indus basin.

Another major change in agriculture was represented by the much greater number of crops that were now cultivated. The major crops for which we have fairly reliable evidence are listed below, classified into 'rabi' (winter) and 'kharif' (summer) crops.

Rabi	*Kharif*
Cereals	*Millets*
Wheat (I)	Bajra (G)
Barley (I)	Ragi (G)
	Jowar (G)
Pulses	*Oil Seeds*
Gram (Chickpea) (I)	Sesame ('til')
Field-pea	*Fibre*
Lentils	Cotton (I)
Oil Seeds	
Linseed (G)	
Mustard (Indian rape)	

Note: (I) = Indus basin only; (G) = Gujarat only.

The wheat grown was confined to bread, club-wheat and shot-wheat, and barley to the six-row varieties. Though rice grains have been recovered from two sites (Rangpur and Lothal) in Gujarat, it is not established whether the rice is of the wild or domesticated variety. Uncertainty still prevails about whether the Mature Indus levels at Harappa have yielded any evidence of domesticated rice. One cannot, therefore, confidently count rice among the crops raised by the Indus people. From their wide distribution and the large quantities in which their seeds have been found, wheat and barley appear to have been the main foodcrops of the Indus basin; on the other hand, millets formed the main foodcrops in Gujarat, and are not attested in the Indus basin. Peasants were thus mainly occupied with 'rabi' crops in the Indus basin, and with 'kharif' in Gujarat. It is, however, most likely that peasants in the Indus basin also grew in the 'kharif' season what are now recognized as 'rabi' crops, despite their unsuitability, just as in Gujarat the peasants must have planted millets in the 'rabi' season, the fields sown in each season being different. It is inconceivable that the peasants would have let half the year pass without growing any food to subsist on. One can only say that their double-harvest agriculture with the same crops sown in both seasons must have been far less productive than in later times (see Chapter 3.1), when a better mix of crops was achieved.

The millets ('jowar' and 'bajra') are believed to have been domesticated in Africa; and India could only have received the crops by a line of transmission (possibly partly by sea) which is still obscure. Lentils were bound to grow in importance since, despite the growing numbers of cattle, the growth in human population was likely to reduce meat consumption per head, and lentils are a good alternative source of proteins.

As we have seen in *Prehistory,* Chapter 3.2, cotton was being cultivated at Mehrgarh (plains of northeast Baluchistan) before 4000 BC. Traces of the fibre and woven cloth were found at Mohenjo Daro, and these point to the species of Indian tree-cotton, *Gossypium arboreum.* This variety of cotton, which had been previously singled out on purely botanical grounds to be possibly the most ancient of cultivated cotton species in India, is a perennial bush or tree and not an annual plant, though the crop of cotton-pods was annually harvested in the 'kharif' season. The development by selection and hybridization of cotton into a bountiful annual field-crop took a long time, and was probably not fully achieved until the early centuries of the Christian era. During the days of the Indus civilization the fibre obtained from the cultivated cotton bush or tree must have been small in quantity. We can, therefore, hardly imagine the ordinary Indus inhabitant to have worn more than very

small bits of cotton clothing, and fuller clothing must have been a mark of some wealth. Woollen clothing too could have been in use, especially in the harsh winters of the Punjab, since sheep had been long domesticated.

Madder, a creeper whose root yields a red dye, could have been wild or cultivated: the fragments of cotton found at Mohenjo Daro have been dyed with madder.

Early and Mature Indus sites have produced evidence (through seeds) of the date, jujube ('ber'), grape and melon. The first two have been found at the earliest inhabited levels of Mehrgarh; the other two were new additions, possibly transmitted from the Helmand basin where too they were being cultivated (see Chapter 1.2).

Among the animal bones, an overwhelming number belongs to cattle (oxen) of the *zebu*, or humped, kind, the dominant domesticated cattle species in India. The ox drew the plough and the cart, the cow provided milk, and both formed a major source of animal food for the Indus people. The humped bull is fairly realistically portrayed on Indus seals (*Figure 2.3*). While the water buffalo is also pictured on seals, buffalo bones are not found in numbers large enough for us to be sure that the animal had been domesticated. The horns of a domesticated variety have, however, been found at Balakot, near Karachi. The one-humped camel (dromedary), which now so extensively substitutes for the ox as a draught and pack animal in the Indus region, is not attested in Sindh before the seventh century AD. The species of camel whose bones have been found at Mohenjo Daro and some other Indus sites was probably that of the two-humped (Bactrian) camel, a pack animal of colder climes, probably brought to the Indus towns with merchants' caravans from Afghanistan and beyond.



FIG. 2.3 Bull on Mohenjo Daro seal.
(After U. Franke-Vogt)
In the seal-impression, the direction would be reversed.

The ox had no competition from the horse either. The horse is not depicted on any of the seals; nor is it recognizable among any terracotta figurines. The bones so far attributed to the domesticated horse (as at Surkotada) are almost certainly those of the wild ass (onager), whose natural habitat included the Indus region and Kachchh, where it is still found.

The bones of sheep and goats are found in numbers large enough to show that they were kept partly at least for their meat. The fact that sheep



FIG. 2.4 Water buffalo being killed by hunter: moulded clay tablet, Harappa. (After J.M. Kenoyer)



FIG. 2.5 Fisherman with nets: painting on Indus potsherd. (After S. Ratnagar)

bones far outnumber those of goats at Harappa may mean that the sheep were in much greater demand as a source of wool. Pigs were also a source of meat and might have been at least partly domesticated.

A large number of animals, then, must have been kept by the peasants; and inequalities in rural society could well grow on the basis of the numbers of cattle and other animals possessed by individuals. Moreover, a separate pastoral economy could also now develop, directed to meeting the peasants' demand for animals and their products. Outside the cultivated zone, which, in view of low population density, must have been small in extent, there were large tracts where animals could be bred by semi-nomadic communities for being sold to sedentary populations, along with milk products, wool and hide. Bits of broken pottery with slight mud structures are, however, all that may remain of the possible encampments of such nomads (Valabhi in Gujarat has been identified as one such site).

Hunting too was important. The depiction of certain scenes on the Indus seals show that encounters with wild and ferocious animals were a familiar fact of life. The water buffalo could be hunted for meat (*Figure 2.4*), and the elephant for ivory as well. At Balakot, on the east Baluchistan coast, not far from Karachi, the Indus civilization levels are marked by much greater use of fish and molluscs for food, and this may mean that by now more efficient means (better boats and nets) had been devised to exploit marine resources. Incidentally, a fisherman with two nets is shown on a potsherd from Harappa (*Figure 2.5*).

2.3 Craft Production

The Indus civilization was, in the true sense, Chalcolithic. While the bulk of tools, especially cutting and breaking .tools, were still made of stone, tools made of copper now began to play a key role, not only because they could withstand high pressure without breaking, but also because they

could help cut stone tools more finely and so make them more efficient.

The Indus people deliberately alloyed copper with tin in order to obtain bronze, which is more malleable and strong. They could thus make better knives, axes and chisels. Whereas 70 per cent of analysed copper artefacts from Mohenjo Daro and Harappa have been found to contain 1 per cent tin (probably the same as found in the natural ore), the remaining 30 per cent had tin ranging from 8 to 12 per cent, which indicates that tin was here deliberately mixed with copper. The proportion of bronze within copper artefacts increases significantly with time at Mohenjo Daro, and this was probably the case in the Indus civilization generally. Nickel, arsenic and lead were also used as copper alloys.

Copper was smelted in brick-lined pits, and wax-and-clay moulds were probably used to cast whole or parts of copper and bronze artefacts. These included tools such as razors, knives, chisels, hooks, sickles, saws and axes. The saw is especially noteworthy, though the teeth were irregular and little more than notches (*Figure 2.6*). On the other hand, the copper axe remained flat and unsocketed. Despite the presence of the socketed axe in the neighbouring Helmand civilization (Chapter 1.2), and the fact that in its Mature Indus levels Mohenjo Daro has yielded a possible pottery model of a socketed axe, the one copper socketed axe-and-adze found there is from unstratified levels and probably belongs to the succeeding Jukhar culture. Smaller copper tools include awls, nails, needles and tubular drills. Besides

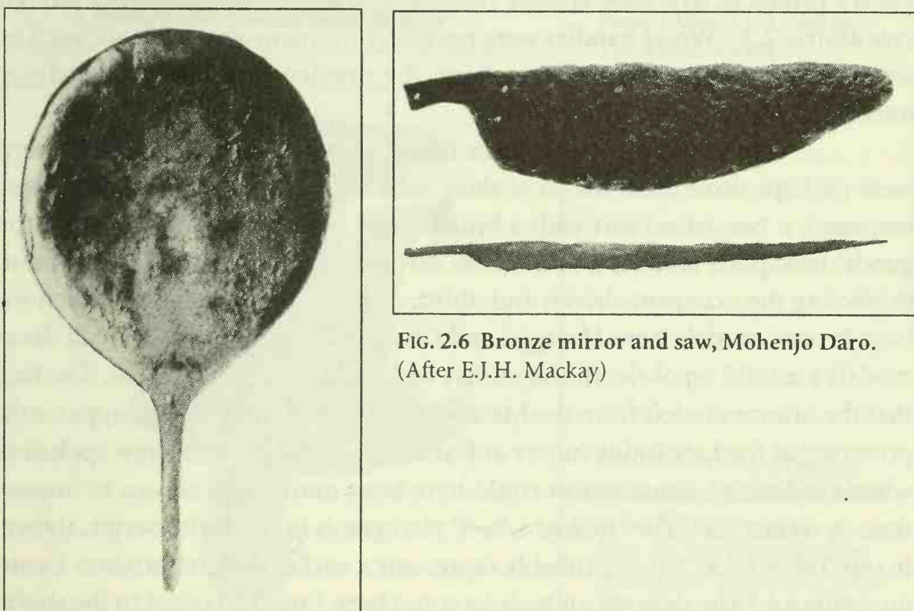


FIG. 2.6 Bronze mirror and saw, Mohenjo Daro. (After E.J.H. Mackay)

knives and axes, which served as both tools and weapons, there are found flat arrowheads and spearheads and (rarely) mid-ribbed swords. A considerable number of copper and bronze utensils (pots and pans) suggests that at least richer households could now use metalware in addition to the breakable pottery. There were also bronze mirrors, undoubtedly a luxury item (*Figure 2.6*). Bronze sculptures are considered under art below (2.6).

In numbers and mass, tools made of stone vastly exceeded those of copper and bronze. The Rohri (or Sukkur) hills of northern Sindh were a major source of the grey flint or chert out of which these were mostly made. Longer and more regular blade-cores and blades could be cut out of stone by use of copper tools than was possible in earlier, Neolithic times. Most of the stone-blade 'factories' on these hills were near the Indus, situated on both sides of the river, suggesting that the finished stone artefacts were sent by boat from here to Mohenjo Daro and other places. At Chanhu Daro, in a bead-maker's workshop, were found tiny stone drills by which holes were drilled in cornelian and agate beads. On the other hand, stone mullers and querns continued to be made as they had been in Neolithic times.

A third important raw material of what may be called the Indus 'capital-goods' industry was wood. Unluckily, hardly any actual products of Indus carpentry have survived, in contrast to what the dry soil has preserved at Shahr-i Sokhta (see Chapter 1.2). However, there are clay and even bronze models, apparently serving as toys, that enable us to say something about carpentry products. We have already referred to the clay models of the plough (see above, 2.2). Wood handles were necessary for many copper tools, such as sickles, axes and adzes. But it is, perhaps, the wooden carts that call for closer attention.

The numerous toy models found at Indus sites suggest that there were perhaps three main forms of these vehicles (*Figure 2.7*). First, and most common, a two-wheel cart with a broad frame, which was mainly meant for goods' transport; second, a four-wheel cart with a spoon-like wooden frame protecting the occupant-driver; and, third, a light cart or chariot, of which we have bronze models from Harappa and Chanhu Daro. The wheels in all these models are solid (spokeless), sometimes with hubs, but generally flat. The fact that the bronze models from the Mature Indus period (and the one apparently preserved at the Late Indus colony at Daimabad, *Fig. 2.25*) also show spokeless wheels is decisive, since spokes could have been more easily shown in bronze than in terracotta. (The 'spoked wheel' pictograph in the Indus script, shown in our Table 2.2 at No. 9, probably represents a wickerwork or bamboo frame for a parasol.) The draught animals have not been found attached to the shafts

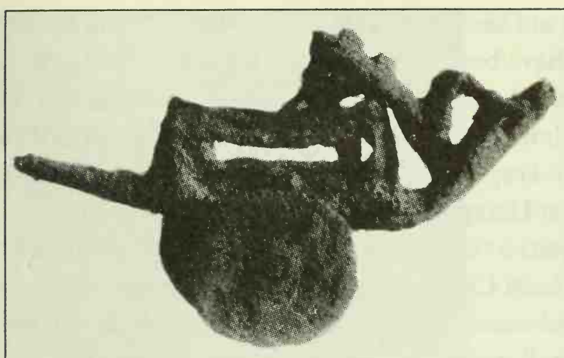


FIG. 2.7 (a) Cart, bronze model, Chanhu Daro.
(After E.J.H. Mackay)

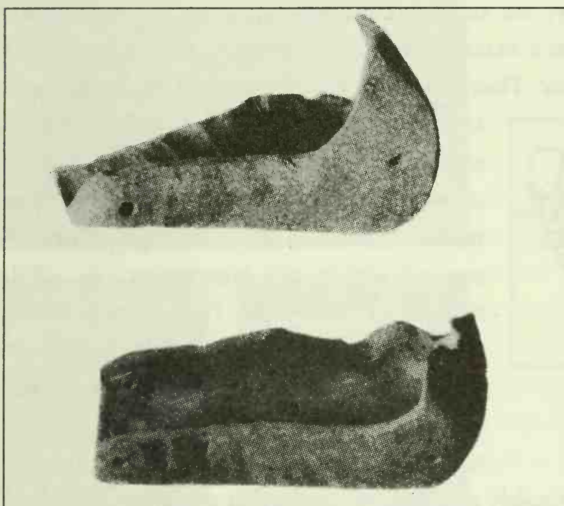


FIG. 2.7 (b) Four-wheeled wagon, clay models, Chanhu Daro. (After E.J.H. Mackay)
The wheels are lost.

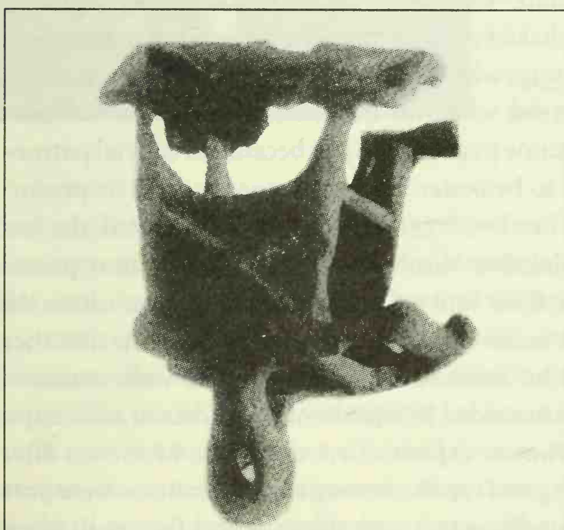


FIG. 2.7 (c) Roofed chariot, bronze model, Chanhu Daro.
(After E.J.H. Mackay)
Note the height obtained by placing axle-holes so far below the chariot floor.

of any of the toy carts (except at Daimabad); but toy figurines of oxen in clay and bronze found separately have been seen to fit the toy carts fairly well. It can be imagined that with copper tools, notably saws, cart-making should have improved substantially; but it is possible that it was ropes and wooden pins that served basically to keep the cart-frame together. The distance between the parallel cart-ruts at Harappa (Early Indus levels) was found to be about 1.07 metres, which suggests a very modest size for the cart. The coloured model of a wheel with a hub from Chanhu Daro shows that wheels could be made of three separate blocks of wood, so that though solid, the wheels did not need to have been of a very small size.

Rather surprisingly, we have no models of boats. One drawing scratched on a potsherd shows a vessel with a mast carrying furled sails, with a steersman rowing with an oar. This is our only evidence that Indus carpenters were making vessels that had sails. A seal carries the picture of a river-boat with timbers lashed by ropes, a large two-storeyed central cabin and high prows, on one of which the steersman sits while rowing (*Figure 2.8*). This was, perhaps, the common river-boat of the times, which survived, like the bullock-cart, until modern times.

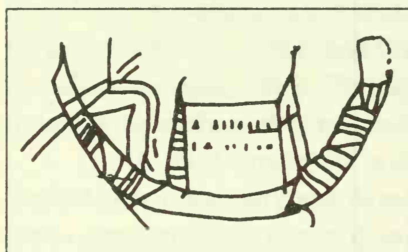


FIG. 2.8 River vessel on Indus seal. (After S. Ratnagar)

Among the 'consumer-goods' industries, one of the most visible, and possibly employing the largest number outside of agriculture, was the potter's craft. The characteristic Indus pottery is wheel-produced, thick-walled, plain, baked red and designed for utilitarian purposes. It is remarkable that such pottery, which served the ordinary masses and not just the elite, should have spread wherever the Indus civilization was established. It is possible that it became popular not just because of official patronage, but because it turned out to be better made and sturdier than its precursors. The kilns in which it was fired were certainly more sophisticated: the fuel was put in a lower circular chamber through a stock-hole; the heat passed through well-spaced holes in a floor into a domed chamber above, where the pots were placed. Some of the small cups were apparently so cheap that they were thrown away by those who received water from public wells: some of these wells have been found surrounded by masses of fragments of such cups. Other pottery pieces were, however, expensive enough to be kept even after being damaged, with retouching and repair. Among such finer items were pots or cups with red slips, and pots decorated with patterns and figures in black



FIG. 2.9 (a) Disposable (?) cup with seal impression, Mohenjo Daro. (After U. Frank-Vogt)

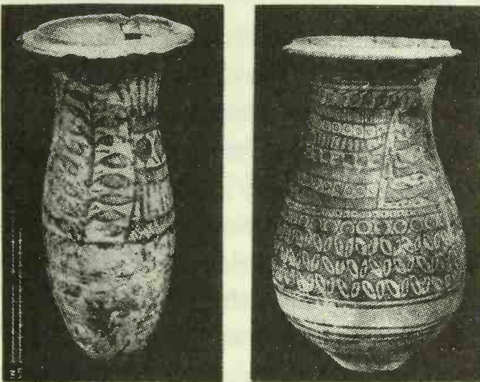


FIG. 2.9 (b) 'Monochrome' (black on red) pots, Harappa. (After S. Piggott)

('monochrome') (*Figure 2.9*). Indus pottery served a large range of purposes, as storage jars, cooking utensils, dishes and bowls, containers, stainers, etc. The cups, bowls and jars were of various shapes, some with lids, others with pronounced rims. The stainers are profusely perforated; but especially to be noted are dishes and bowls on stands, which demanded much skill from the potter. The use of pottery water pipes for house drains needs also to be noted.

A large number of small pieces made of terracotta represent women, men, animals, carts and other items. Many of them are obviously toys; others are possibly godlings or deities. These were easy to make and many

are, perhaps, home-made. Some fired clay tablets containing 'narrative' pictures were made from moulds, and so could presumably be duplicated in considerable numbers. Among the 'luxury' products of the time are 'stoneware' bangles. These were made of high-fired, well-vitrified, non-porous clay through a complex process, after being been put in moulds. They are grey to black in colour, and are only found at the two major cities of Mohenjo Daro and Harappa.

Next to pottery, we may expect textiles to be the craft engaging large numbers of people. Numerous spindle-whorls of terracotta and frit (unglazed vitreous paste) are found in Indus settlements, showing that hand-spinning was widespread, presumably as a woman's chore in each household, rich and poor. Of the wooden looms, however, there is no trace. The minute fragments of dyed woven cotton recovered from Mohenjo Daro constitute one of the two earliest known examples of cotton cloth in the world (the other example coming from Jordan, dated to a time before 3000 BC). The trefoil motifs on the robe of the 'Priest-King' in stone sculpture from Mohenjo Daro are obviously the result of embroidery, which copper needles (with 'eyes') must have made much easier (*Figure 2.16*).

The excavated cities and towns of the Indus civilization are proof that the building industry had now a major place in the economy. The fired brick used in the houses of the rich and in other important buildings, drains, etc., was an outstanding innovation; its size and the technique of its use are still more remarkable. The standard universal size of the Indus fired brick is generally about 7 x 15 x 31 centimetres, giving roughly the ratio of 1:2:4. The ratios are very convenient for the manner in which the bricks were often laid: the method followed is now known as 'English bond', where headers follow stretchers in alternate courses. This method, which gives extra stability to the wall, together with the large size of the bricks, imparts a very modern appearance to Indus brickwork. While mud was ordinarily used as mortar, gypsum was employed in special cases, and bitumen was used in the 'Great Bath' at Mohenjo Daro. Nearly three thousand years were to pass after the end of the Indus civilization before gypsum and bitumen were again used in India for cementing purposes. The Indus bricks are generally well-fired; and there must have been many brick kilns around cities like Mohenjo Daro and Harappa. The supposition, however, that Sindh and the Punjab must then have had greater precipitation in order to grow sufficient wood for use in brick kilns, is not valid, since in the seventeenth century Multan and Thatta were much larger brick-using cities than Mohenjo Daro and Harappa, and enough wood could yet be found for their brick kilns.

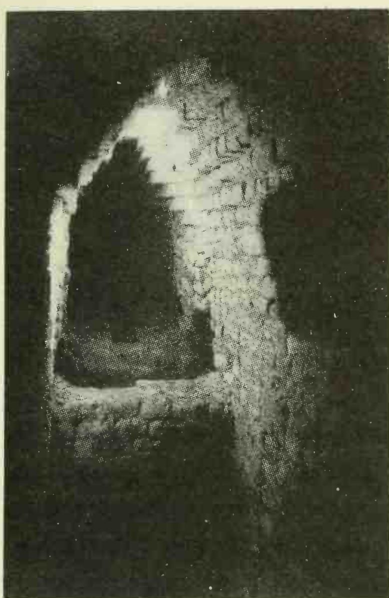


Fig. 2.10 Corbelled arch over drain, Mohenjo Daro. (After M. Jansen)

The Indus masons showed their skills in constructing wells, using wedge-shaped bricks to make them circular (*Figure 2.2*), and putting corbelled roofing over doorways and drains (*Figure 2.10*). But they had no notion of the true arch and vault; therefore, house roofs had to be built by laying wooden beams and matting.

Indus building activity only partly consisted of work with baked bricks. Sun-dried bricks, usually of the same standard size as the fired bricks, were used to build platforms, and city or citadel walls. They were the sole kind of brick used in villages and remained the chief building material in most city houses, sometimes mixed with fired bricks in separate courses. Construction with sun-dried bricks could also have employed large numbers of people, though not calling for the specialized skills that fired bricks demanded.

There were, finally, a number of precision crafts, mainly involved in the production of high-value luxury goods. Gold was used in beads and small ornaments. Often it seems to have been used in alloy with silver, the alloy being known as electrum. Silver was the cheaper precious metal, and was used to make small vessels, besides beads, buckles and other small ornaments.

Faience was obtained out of a pulverized mixture of silicates, to which magnesium and some metal oxides were added. Set in a mould and given a glaze, the mixture was fired at very high temperature to produce the desired article in faience. A variety of things such as miniature containers, beads, bangles, buttons, seals, amulets and figurines were made of faience. Quite expensive, they are rarely found in the smaller settlements. Glass-making was as yet unknown.

Among semi-precious stones, jade and lapis lazuli were worked into beads. But cornelian and agate were the stones in which the Indus lapidary mainly worked. The chief source of these semi-precious stones was almost certainly the Ratanpur mines in southern Gujarat. At Lothal, near Khambhat, the stones were worked into beads; but the industry was carried on in more distant places like Kuntasi and Chanhu Daro, and even Shortughai on the Oxus. Many of these stones needed to be heated at high temperatures to



FIG. 2.11 First published Indus seal (from Harappa, by A. Cunningham), with recent photograph of its impression. (After A. Parpola)

bring out their colours. They were cut and then pierced with fine stone drills with cupped points, to serve as beads. The process would have been impossibly strenuous and time-consuming if the drills were directly turned by fingers: the bowstring device was, therefore, probably used to turn the drills. Etched cornelian—an exclusively Indus product—was produced by scratching it with an alkali solution and then heating the stone to absorb it.

Much skill was devoted to work on steatite (talc or soapstone), out of which the Indus seals or 'seal amulets' were mainly made. The seal was usually small and square, the sides ranging generally from 1.9 to 3.2 centimetres, and with a holed boss on the back to enable it to be carried by a thread. The depictions, mainly of animals, along with the written characters on the seal-face, were carved (in the negative) into the stone, so that the seal could make its impression on plastic material like clay or bitumen (*Figure 2.11*). A number of sealings in clay have come down to us; but the seals themselves are far more numerous, over 1,200 of them being found in Mohenjo Daro alone. A few of the seals are round, and very few are in the shape of cylinders (a Mesopotamian form). Some seals are also made of frit and, rather rarely, of silver, marble, calcite, limestone or terracotta.

The seals carry the bulk of the writing that survives from the Indus civilization and, as in the case of the writing itself, there is no significant evidence of any regional variation in seal-type or style. The seal-cutters' customers were undoubtedly the elite of the Indus state and mercantile world, for whom the seal represented a claim to status and property.

Another craft involving precision was the making of measures of weight in the form mainly of chert cubes, that have been found in large numbers at Mohenjo Daro and Harappa. Excluding a few fractional pieces, and counting from a basic unit of 13.63 grams (=1), the scale runs in the ratio of 1, 2, 4, 10, 20, 40, 100, 200, 400, 500, 800, while the fractions are 1/16, 1/8, 1/4

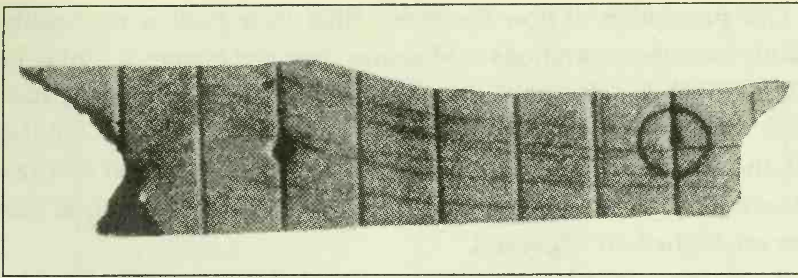


FIG. 2.12 Graduated scale on shell, Mohenjo Daro. (After E.J.H. Mackay)

and 1/2. The heaviest weight known was about 10.9 kilograms and the lightest 85.1 centigrams. A workshop at Chanhu Daro with unfinished products shows how the weights were cut to achieve fair accuracy. For linear measurements graduated scales were prepared, of which three survive, of shell (Mohenjo Daro), bronze (Harappa) and ivory (Lothal). The scales do not conform to each other. Probably, different systems of linear measurement were in vogue; but the use of graduation (*Figure 2.12*) is particularly noteworthy.

Ivory seems to have been scarce and expensive in the Indus civilization, despite the elephant being a familiar animal on seals. Only a few pieces of ivory work have turned up in Mohenjo Daro. On the other hand, a different animal product, the sea-shell, was widely used to make bangles, beads, receptacles, discs and inlay. Evidence for shell-working has turned up at Balakot, Dholavira and Nageshwar—sites on, or close to, the coast. The conch-shell, *Xancus pyrum L.*, found off the Gujarat coast, was a particularly important raw material for shell-working.

2.4 The Cities and Towns

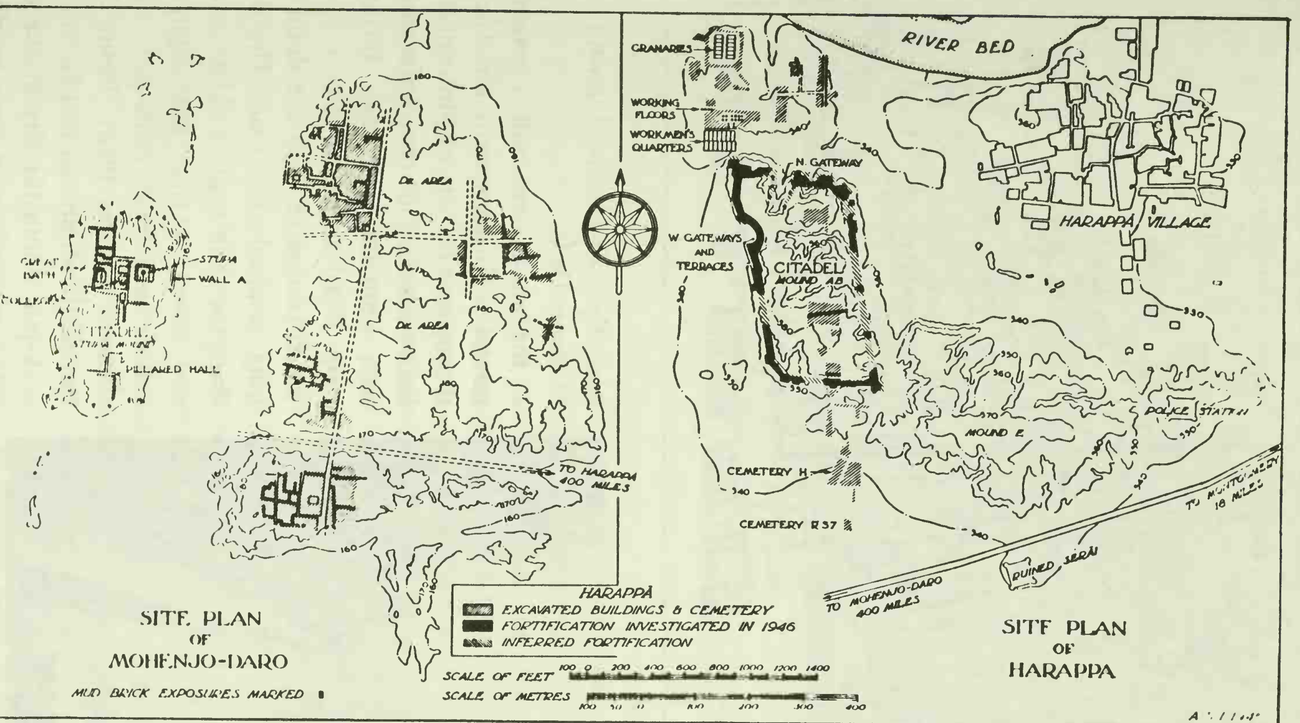
The occupied area of Mohenjo Daro and Harappa is now estimated at over 200 and 150 hectares, respectively. At their greatest prosperity, therefore, the population of Mohenjo Daro could have been about 85,000 and of Harappa, 65,000. Situated between them, by the side of the dried-up Hakra river in southern Punjab, is the site of Ganweriwala, covering an estimated area of 80 hectares. This has not, however, been excavated. Near Patiala in the Mansa district of Punjab, three Indus sites have been assigned very large inhabited areas after a rather hurried survey—Lakhmirwala (225 hectares), Gurni Kalan (144 hectares) and Hasanpur-2 (100 hectares); but one cannot say whether closer scrutiny with excavation will justify such high estimates. In Gujarat, the largest Indus site is Dholavira (60 hectares), in Kachchh.

Our perception of how the Indus cities were built is necessarily derived mainly from the excavations at Mohenjo Daro and Harappa. Mohenjo Daro had been much less disturbed than Harappa, which was especially ravaged by brick robbers supplying ballast for the Northwestern Railway. On the other hand, the water level has risen so much at Mohenjo Daro that we cannot now determine whether it was built on an Early Indus settlement, as was Harappa, or established on virgin soil.

As is the case with practically every Indus town of any size, **Mohenjo Daro** was laid out as a planned city. The so-called 'acropolis' (high town) or 'citadel' was built upon a large platform, constructed with walls of dried mud-brick to retain the infills behind. Similar platforms were built for blocks of houses in the larger 'Lower Town'. The initial platforms were some 10 metres high, but were further raised or extended from time to time: these platforms enabled houses in the city to be built above the flood level. Spaces for roads were marked well before houses were built, so that Mohenjo Daro had long broad roads (unpaved) running parallel with other roads, with lanes meeting them at right angles. While a main street in the acropolis was 6 metres wide, the 'First Street' in the Lower Town had a width of more than 10 metres: it would have allowed two bullock-carts to pass each other with much space to spare. Throughout the larger part of the life of Mohenjo Daro as a city, no encroachments or construction on these roads was allowed. (See *Maps 2.2 A and B* for site plans of Mohenjo Daro and Harappa, and the detailed layout of a part of the excavated area of Mohenjo Daro.)

Once the foundation platforms were raised and the roads marked out, construction began in both the acropolis and the main town, the buildings mostly of mud-brick but raised usually on fired-brick foundation walls. The houses, uniformly rectangular in plan, were of varied sizes; the rooms of each house were arranged around a courtyard. There was invariably a single entrance to the whole, usually so placed that the inside of the courtyard and the rooms opening into it could not be seen from the outside. One of every three houses had a fired-brick lined well, usually near the entrance. Close to the wells, many houses had bathing cells as well. Each sizeable house seems to have contained the families of the master and of his slaves and servants, or accommodated sub-families of a joint family, sharing certain facilities like the well and a common cooking area in the courtyard. Privies (brick-made seats) have been found in some houses. There was a tendency in course of time to sub-divide the larger rooms into smaller ones with new walls and doors. Craft-wastes found in several houses suggest that the artisans' quarters could also be contained within these houses. Houses at practically all Indus sites tend to

Map 2.2A Site Plans of Mohenjo Daro and Harappa. (After M. Wheeler)



Map 2.2B Layout of part of Lower Town of Mohenjo Daro. (After E.J.H. Machay)

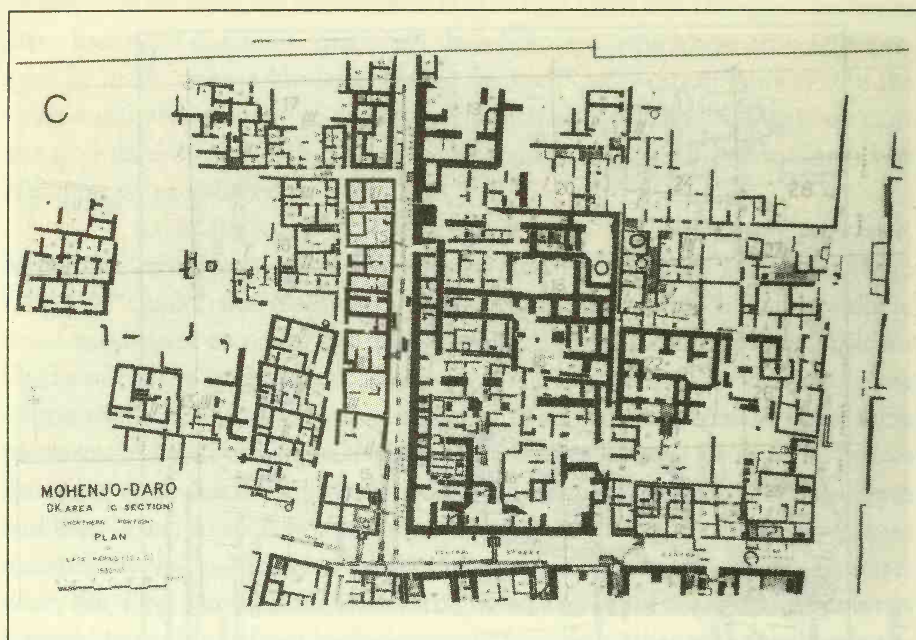




Fig. 2.13 Drain from house (through corbelled opening) joining street drain, Mohenjo Daro. (After E.J.H. Mackay)

have the same general layout as at Mohenjo Daro.

As the houses were built, a remarkably careful drainage system was laid out throughout the city of Mohenjo Daro. Each house had its waste water running out, sometimes through terracotta pipes fitted together, into a cess-pit which connected with the drain running alongside the road. The drains along the main roads could be covered, and sometimes had man-high, corbelled, burnt-brick roofing, to enable cleaners to enter them (*Figure 2.13*). But all the drains ultimately ended in soak-pits within the city by the roadside, and might well have overflowed from time to time. Despite such limitations, the drainage system of Mohenjo

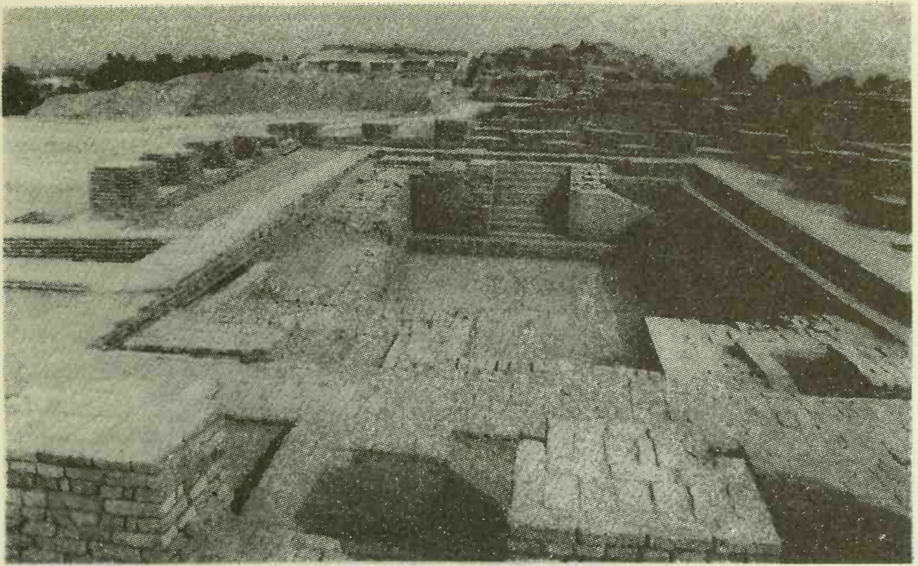


FIG. 2.14 **The Great Bath, Mohenjo Daro.** (After J.M. Kenoyer)

Daro stands unique among the Bronze Age cities of the world.

Within the acropolis at Mohenjo Daro, upon the debris of some earlier buildings, was built the structure known as the Great Bath (*Figure 2.14*). A rectangular tank, 12 x 7 metres and about 2.4 metres deep, it is made of fired bricks, closely fitted together. From the outside the tank was made waterproof by a 3-centimetre thick layer of bitumen. Two staircases from opposite sides descend to the bottom of the tank. Around the tank was a brick-paved gallery with a brick-paved colonnade. There were several rooms adjoining the Bath on the north and east. In one of the eastern rooms there was a large well, from which water was supplied to the tank. There was provision for changing the water, since an outlet at the southern corner of the tank led the water out into a brick drain with corbelled roof. One can imagine that the Great Bath was reserved for a very elite clientele; but it also fits in with the general concern of the people of Mohenjo Daro with water.

To the west of the Bath has been found a massive brick platform, 1,350 square metres in area, on which were built twenty-seven smaller plinths separated by narrow passages and arranged in three rows of nine each. This whole structure has been identified as a 'granary', on the analogy of a similar structure at Harappa.

Another interesting building in the Citadel, in its southern part, is a large pillared hall, there being twenty thick brick pillars arranged in rows of five each, the whole about 750 square metres in area. There is no indication of

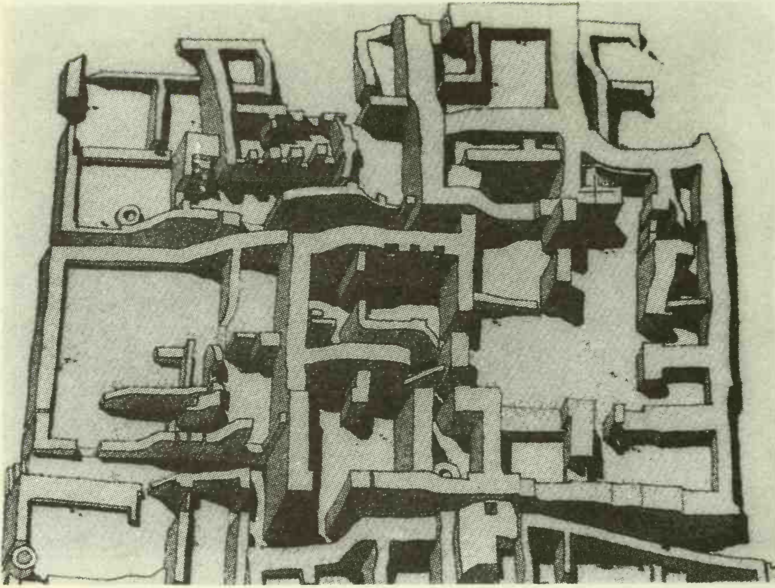


FIG. 2.15 Isometric drawing of a 'palace' in Lower Town, Mohenjo Daro.
(After M. Jansen)

what the roof was made of: its original purpose was probably for holding an assembly of some kind (ceremonial or religious?); later it was sub-divided, its different parts being walled off.

In the Lower Town, there is a very large house which may deserve even to be called a notable's palace: it was nearly 300 square metres in area and ultimately contained some twenty rooms set around a courtyard (*Figure 2.15*). Another large house was apparently non-residential, and could be a temple: two staircases opposite to each other led to the upper storey, and a number of vessels of alabaster and objects of faience and ivory were found here along with fifteen seals, many depicting the mythical single-horned humpless bull ('unicorn').

In contrast to these structures and also the general style of houses, is a group of sixteen small, two-room quarters (6 x 3.6 metres, internally), built in two rows. Described in modern reports as 'coolie lines', these had a counterpart in Harappa as well.

It has been estimated that Mohenjo Daro contained 2,000–3,000 houses and some 700 wells. These estimates may have to be raised, as the occupied area is now estimated to be much larger. Still, even with a population of 85,000 or so, Mohenjo Daro would appear to us today as a small or moderate-sized town. But in its own age, it was one of the great cities of the world.

Harappa was probably slightly smaller than Mohenjo Daro; it was built over a Kot-Diji settlement in the same planned manner as Mohenjo Daro. It had an acropolis ('Citadel') set upon a massive platform, held by a retaining mud-brick wall with a facing of fired bricks. The retaining wall, rising to 10.7 metres from the ground, also served the purpose of 'defence' works. The Citadel had two gateways (Northern and Western), of which one (the Western) was later blocked. Just outside the Citadel to the north lay a number of 'workmen's quarters', similar to, though larger than, the 'coolie lines' at Mohenjo Daro. These adjoined several rows of fired-brick floors with space at the centre for wooden mortars, in which wheat and barley were milled. Further to the north was a large structure, built over a mud-brick platform, containing on both sides of a central aisle numerous blocks built of bricks. These blocks probably served as floors of wooden structures for storing grain; and the whole building is interpreted as a great granary. There are metal workers' furnaces close by.

Unfortunately, brick robbers so ravaged the Citadel buildings at Harappa that almost nothing can be said about its structures. The same was the fate of the buildings in the Lower or Main Town to the southeast of the Citadel. But fresh excavations have confirmed that the Lower Town was also planned in a manner similar to Mohenjo Daro, as may be seen from certain excavated portions of roads and drains (including a corbelled drain of fired brick). Harappa apparently had far fewer wells (perhaps thirty), but every house had a latrine, with sump-pots, connected to the street drains. The Lower Town had a boundary wall of mud-bricks, 6 to 7 metres thick and (as preserved) over 2.6 metres high. Finds of waste and unfinished products indicate that craft workshops were concentrated in particular quarters of the town.

Among the other excavated sites the largest, perhaps, is **Dholavira**, with an extent of 60 hectares (but not all of it inhabited). It is situated in an island of the Great Rann of Kachchh. It has an impressive walled acropolis ('castle') with an outer court ('bailey'), both linked to a walled 'middle town', all surrounded by an open walled area within which, on the eastern side, was a lower town. The walls and buildings are made of mud-bricks, with stones (sometimes polished) substituting for fired bricks. Dholavira shows the principal elements of Indus town-planning, in its laid-out roads and special attention to water supply through wells and tanks. Within the castle was found a tank lined with stone blocks reinforced by lime-plaster, some 12.8 metres wide and fed by rain water. Incidentally, Dholavira has given us the largest Indus inscription (in size of characters), which was probably originally put on the castle gateway.

Kalibangan, on the banks of the dried-up channel of the Ghaggar in north Rajasthan, has already been mentioned (Chapter 1.3) as an Early Indus site. It was now entirely rebuilt. Though a small town (11.5 hectares), it was yet provided with an acropolis along with a 'lower town', both containing well-planned streets (maximum width, 3.7 metres) and lanes. Both the acropolis (in two parts) and the lower town were walled. Mud-brick was used throughout, in the town walls as well as in the houses; the use of fired brick is quite rare. The waste water from the houses emptied into jars outside: there were no drains along the road, owing presumably to the extreme dry climate of the place. The houses generally were of the Indus style, their various parts ranged around courtyards.

Our survey of individual Indus towns may close with two townships of about the same size. **Chanhu Daro** (4.7 hectares) in Sindh could have been an ordinary quarter of Mohenjo Daro: planned, with the main thoroughfare 7.5 metres wide, the streets provided with drains of fired brick, and houses consisting of rooms around courtyards with privies and bathrooms. Of considerable interest is a 'bead factory' with flues and furnace, manufacturing steatite beads.

Lothal (4.8 hectares), not far from Khambhat (Cambay) in Gujarat, may be described as a seaport, so long as we remember that it could only have been an inner port, able to receive no more than light boats by an estuary at high tide, while the real seaport must have been at a distance, perhaps somewhere near Ghogha, the seaport that used to serve Khambhat in medieval times. This needs to be borne in mind when one considers the remarkable tank, 212–215 metres long and 35–37 metres broad, with sides built of fired brick. There is some evidence that it received sea water; but if it was a 'dockyard', as the excavator S.R. Rao suggested, then it could have received only very small boats, since the inlet into it had little depth. The alternative suggestion that it was an irrigation tank also has problems with it, especially since such a masonry structure was hardly necessary for providing water for field irrigation. The 'warehouse', close to the tank and within the small 'acropolis', consisted of a mud-brick platform supporting numerous mud-brick blocks of identical size which, under a wooden structure, stored parcels of goods. Some 65 terracotta sealings were recovered from here. Lothal shows signs of having experienced considerable prosperity. A few of its roads were even rammed with *kankar* or with terracotta balls, or paved with mud-bricks and calcified grit. The drainage system was fairly elaborate, the drained water flowing into a cess-pool and into the 'dock'. There were workshops of shell-cutters and bead-makers. A thick mud-brick wall surrounded the town.

For reasons of space we must regretfully leave out many other interesting excavated Indus sites, but finds from them are mentioned at several places in this chapter.

2.5 Trade

Trade in the Indus civilization can be considered at three levels: local village–town trade; long-distance trade within the territory of the civilization; and commerce with other regions.

If the two large structures at Harappa and Mohenjo Daro are correctly identified by Vats and Wheeler as granaries, we may assume that these granaries stored grain brought by officials by way of tax levied on villages attached to the two towns. At Mohenjo Daro the granary is within the Citadel, while at Harappa it is outside, but in close proximity to the Citadel and well away from the Lower Town. The grain stored here, then, was probably meant for distribution within the Citadels. For the ordinary inhabitants, the grain they needed must have been brought by merchants or grain-carriers, on pack-oxen, carts and river-craft—and also possibly on human backs.

Another source of local trade was the supply of raw materials to urban craft centres. This may be illustrated by the evidence of sea-shell workings at Balakot, Dholavira, Nageshwar and Lothal. The marine shells must have come from places on the seashore in the vicinity of these townships. Similarly, agate and cornelian cut into beads at Lothal came from the famous Ratanpur mines just south of the Narmada river near Bharuch. The large stone workings near Sukkur on both sides of the Indus can be explained only by the large demand for chert blades from Mohenjo Daro down the Indus river, though in this case the major part of the 'manufacturing' was probably done at the quarries themselves.

The uniformity in the style of many artefacts found at various places within the Indus territory gives the impression of considerable long-distance trade which kept up similar tastes and fashions in manufactured goods in all of the territory's several parts. This might also have been achieved, in at least some cases, more by the migration of artisans from the core areas than by the transport of goods. Fired bricks at Kalibangan or Lothal could not have been exported from Harappa and Mohenjo Daro; men skilled in baking bricks in kilns must have gone there. So also, the identical Indus styles of pottery, at any rate the cheaper sort, must have been made by potters locally, since risks of breakage would make long-distance transportation prohibitively expensive. The same may be said of seals, but for another reason: it is likely that the seals were made for individual owners, and so made according to

individual preferences. They were thus presumably made only locally; and yet they all bear strong marks of uniformity in the pictures and characters they contain. At Dholavira, the seals first lacked any inscriptions and had only pictures: the writing on seals there appeared only later. Apparently, the craftsmen who first went there could not cut the Indus characters; those who could, came much afterwards.

Yet, evidence of export of commodities over long distances is by no means absent. For instance, agate and cornelian pieces from the Ratanpur mines south of the Narmada were conveyed not only to Lothal, but also to Kuntasi (on the Saurashtra coast facing Kachchh) and to Chanhu Daro in the middle of Sindh, as raw material for bead-manufacturers there. Gold used by Indus metalsmiths came almost certainly from the banks of the Indus and its tributaries in and near the Himalayas, where gold dust could be collected. (It seems unlikely that the very small quantity of gold found in the Indus sites came from the far-off Karnataka mines.) Specialized products, like faience, which were relatively rare, and articles made of shells, mainly worked in centres near the coast, were also clearly items of long-distance trade.

The Indus river system made for easier transportation, though the downstream (southward) movement by boat was naturally easier than the upstream (northward). There could be some traffic also on the Ghaggar–Hakra river, now dry, but then flowing down to about the middle of Bahawalpur district. In the south it is possible that a riverine connection existed, at least seasonally, between the Eastern Nara, a branch of the Indus, and the mud flats near Lothal, by which small boats could carry cargo: this might explain the importance of Dholavira, a notable town, placed in what is today an isolated island in the Rann. Carts and pack-oxen could cover some land sections of long-distance routes, for example, between Harappa and Kalibangan, but such transport must have been more expensive than that by boats.

It is likely that most long-distance commerce was undertaken by individual merchants. In the warehouse at Lothal, 65 seal impressions ('sealings') on terracotta pieces have been found, which often bear on the other side impressions of mats, cloth or twisted fibre, showing that each of these seals was put on reed-mat or cloth tied to the mouth of a jar containing merchandise. None of the warehouse sealings matches any seals found at Lothal; so it has been inferred that the items on which these were affixed (and which were apparently burnt in a fire) had been brought to Lothal from other places in the Indus territory.

Such a scale of local and long-distance trade raises the question of how the goods were bought and sold. We have seen (above, 2.3) that great care

was taken to maintain uniformity in weights throughout the Indus territory. Many goods must then have been priced according to their weight. But there were no coins in terms of which prices could be stated; and we are still uncertain as to what the materials were that could have served as money. For certain transactions, particular measures of grain or numbers of agate and cornelian beads or sea-shells might have been used as mediums of payment. It is, in any case, certain that the extensive Indus trading system could not have worked merely through barter (exchange of one set of goods for another). There is also the possibility that some seals served as 'tokens' for goods, and their undeciphered texts might indicate their 'value' in terms of particular goods.

Finally, we come to what may be called 'international trade', the trade of the Indus civilization with territories outside its limits. We may begin anti-clockwise from the southeast. There is no firm evidence of any trade with Neolithic South India (*Prehistory*, Chapter 3.5), though the Late Indus settlement (with pitiful survival of seals and Indus writing) at Daimabad, in Ahmednagar district of Maharashtra, *c.* 1900–1700 BC, suggests that there might have been earlier commercial links with at least the upper Godavari basin. Further north at Kayatha, near Ujjain in Madhya Pradesh, the type-site of a culture which could go back to 2400 BC, three caches were found, two of cornelian and agate beads and one of steatite micro-beads, which could all have come from workshops in the Indus territories.

Rajasthan probably played a much more important role in the external trade of the Indus civilization, owing to its copper resources in Mewar and in northeast Rajasthan. Mines in Mewar were obviously the sources of copper used in the Banas culture (3000–1300 BC). In northeastern Rajasthan, the Ochre-Coloured Pottery (OCP) culture sites of Ganeshwar and Jodhpura (2800–1500 BC) lie close to the old Bairat–Singhana copper mines (and the modern Khetri mines), and this area too could have provided part of the copper that the Indus civilization needed. It is significant that there are signs of Indus influences on the pottery of Ganeshwar and Jodhpura.

In the north, the Neolithic culture of Kashmir in its ceramic phase (2500–2000 BC) was practically contemporaneous with the Indus civilization (see *Prehistory*, Chapter 3.5). It is possible that the Indus lapidaries obtained their jade from Kashmir (where jade rings have been found), which in turn must have imported it from the Khotan area of Xinjiang (China) across the Karakoram range. On the other hand, Kashmir itself received cornelian and agate beads (some 900 of which were found in a Kot-Diji-style pot at Burzahom, the main site of Kashmir's Neolithic culture) from the Indus territories.

The Indus civilization probably drew its silver, or much of it, from

the mines, famous in early medieval times, situated in the Panjshir valley in northern Afghanistan. This becomes likelier when we consider that the valley lay astride the best route connecting the Indus basin with Shortughai, on the Oxus river in northeastern Afghanistan. Within a period carbon-dated 2865–1975 BC, the pottery, mud-bricks, houses and artefacts at Shortughai, all followed Mature Indus models. Its people partly sustained themselves by cultivation (a ploughed field and traces of irrigation have been found). But its real industry seems to have been the making of lapis lazuli beads. This semi-precious stone almost certainly came from the celebrated mines at Sar-i Sang on the upper reaches of the Kokcha river, near whose junction with the Oxus Shortughai is itself situated. At Shortughai, craftsmen also cut agate and cornelian beads, obviously receiving their raw material from the Indus basin. Thus, agate and cornelian exchanged with lapis lazuli, with Shortughai serving as the entrepot. The lapis lazuli on which the Chanhu Daro artisan worked, then, must have been imported via Shortughai.

Further inland still, an Indus seal has been found at Altyn Depe in Turkmenistan in the contemporary phase (V) of the Namazga culture; the etched cornelian beads and ivory found there were probably taken there by Indus merchants. On the other hand, evidence of caravans led by Central Asian merchants into the Indus basin comes from the possible remains of Bactrian camels found at Mohenjo Daro and Harappa (see above, 2.2). What at the moment defies explanation is the lack of any evidence of contact between the Indus civilization and the trans-Indus Kot-Diji culture area (in NWFP, Pakistan), and the Helmand civilization further west, despite their greater proximity to the Indus basin. Some of the shells worked at Shahr-i Sokhta (Sistan) might have come from the Indus coastal settlements, but there is almost no other evidence of contact, leaving aside a single Indus etched-cornelian bead at Mundigak.

Somewhat uncertain too is the extent of trade with the area of the Proto-Elamite culture (3100–2100 BC), which had its main seat at Susa in southwestern Iran. Proto-Elamite influences had spread to Shahr-i Sokhta (see Chapter 1.2) and to western Baluchistan, where Proto-Elamite pottery has been found at Miri Qalat. On the other hand, Mature Indus seals have been found at Susa and at the Elamite site of Tepe Yahya in central Iran, suggesting the presence of Indus merchants there. What exactly was traded, however, remains unclear.

We, finally, come to links with Western Asia. So far as we can judge these were not maintained by the overland route, but by sea. At that time the discovery that monsoon winds can carry sailing ships across the Arabian Sea

had not been made, and the main sea traffic was along the coast, the ships being heavily dependent upon supplies from ports situated at intermediate stages in their voyage. This might explain the Indus settlements so far west on the Mukran (Baluchistan) coast as Sotkakoh and the fortified settlement of Sutkagen-dor, the latter close to the Pakistan–Iran frontier.

Opposite Sutkagen-dor, across the Gulf of Oman, is the site of Ras al-Junayz in Oman. Oman was known to the Sumerians at the time as the country of 'Magan'. At Ras al-Junayz and elsewhere in Oman has been found evidence of many Indus imports such as large pottery jars, alabaster vases, etched cornelian beads, metal artefacts and ivory-work. Copper and steatite seals represent the presence of Indus merchants. But the Indus artisan too came here. Though Oman or 'Magan' had its own culture alongside its own pottery, there is found at some sites here much Indus pottery, usually made of local materials, as well as seals and metal artefacts made locally but in the Indus fashion.

From Oman, ships coming from the Indus ports sailed northwestward to enter the Persian Gulf and make their way to what the Sumerians knew as 'Dilmun', comprising the islands of Bahrain and Faylakah (off Kuwait), and the neighbouring Arabian coast. This too had a culture of its own; but there have been found here a number of seals of the local shape and yet bearing Indus characters, which suggests a community of Indus merchants operating locally in Dilmun. At Lothal, on the other hand, a Dilmun seal has been found, showing that Dilmun merchants too made their way to that port.

'Dilmun' was the gateway to Iraq (Mesopotamia), whose people gave to the Indus basin the name of 'Meluhha', which, for all we know, might be a corrupt form of the name that the Indus people used for their own country. Sargon, the king of Akkad (2334–2279 BC), in an inscription, claims that ships from Meluhha sailed up the Tigris to his capital in central Iraq, along with those of Dilmun and Magan. Etched cornelian beads, a characteristic Indus product, were found in the royal cemetery at Ur (southern Iraq), *c.* 2350 BC. At Tell Asmar, dating to the period 2350–2000 BC, were found not only these but also ivory-inlay pieces and potsherds of Indus knobbed-ware jars. Mesopotamian texts of the period 2350–2000 BC tell us of articles of ivory, inlay-work, gold, cornelian, hard woods, rare animals and slaves being brought from Meluhha. The presence of Indus merchants, presumably first settled in Dilmun and then moving to Mesopotamia, is attested by six Dilmun-style seals bearing Indus characters and the figure of the *zebu* bull and 'manger', found at Ur (southern Iraq). A cylinder seal of the Akkadian period (2375–2230 BC) describes its owner as 'Silusu, Meluhha interpreter'. In

documents from Ur, of 2113–2000 BC, we have references to people of Meluhha actually settled there—even to a 'Meluhha village', which reminds us of the kind of Indus communities that had settled at Shortughai and in Oman. (See Map 1.1 for lands west of the Indus.)

We have practically no information of what goods Indus territories received in return from Mesopotamia. The Mesopotamian fashion displayed in the beard and robe-decoration in the stone statue of the 'Priest King' (see below, 2.6), however, strongly suggests familiarity with Mesopotamian culture at Mohenjo Daro; and a young woman buried in Harappa in the Sumerian fashion, wrapped in reed-matting within a wooden-lidded coffin, even offers evidence of the presence of a Mesopotamian community in that city.

2.6 Culture: Writing, Art, Religion

A major achievement of the Indus civilization was the invention of **writing**, which is one of its hallmarks from the beginning, *c.* 2500 BC, and which disappears, along with it, shortly after 2000 BC. It is one of the world's four earliest known scripts, but there are no indications of how it came to be created. There are, for example, no earlier pictographic symbols used in graffiti (incised or painted marks) on clay or stone, out of which it developed. It seems possible that it came into existence directly as a logo-syllabic script under the influence of the earlier Proto-Elamite script of southwestern Iran, whose domain, reaching up to Shahr-i Sokhta, came close to the borders of the Indus civilization. The Proto-Elamite script was not only logo-syllabic but was also similar, though not identical, to it in appearance. Unluckily, neither script has been deciphered so far.

Indus writing comes to us in the form of short inscriptions (about 4,000 in all), each of about five characters on average. These are found mainly on stamp-seals of various materials, notably steatite; seal impressions on clay, pottery and baked-clay moulds; inscribed copper and clay tablets; and scrawls on metal artefacts and pottery. If the Indus people wrote on cloth, tree-bark or leaves, these materials have all perished. The writing is usually from right to left, though the second line sometimes runs back from left to right.

While, until the script is deciphered, the contents of the inscriptions cannot be ascertained, such of these as occur on seals and tablets probably give the owner's or ruler's name, a short invocation to a deity for protection, and certain measures or values of goods. The language of the script is likely to be the 'official' one universally in use among the Indus ruling class, merchants and priests. Perhaps, except for the undetermined original core area of the Indus civilization, the language would not have been the common

speech of the territory where the script was used. From certain indications within the script, such as the frequent 'fish' sign, it seems likely (though not certain) that it belonged to the family of Dravidian languages. This notion was originally suggested by the survival of the Brahui language in northeastern Baluchistan and adjoining areas of Afghanistan, for Brahui is a north Dravidian language, which was earlier spoken in parts of the Indus basin as well. Connections have been established between it and the ancient Elamite language, and this, given the possibility of Proto-Elamite serving as the model for the Indus script, strongly reinforces the case for the Dravidian or Elamo-Dravidian affiliations of the Indus language. (See Note 2.1, for possible ways of studying the Indus script.)

When the Indus script is deciphered, we may be able to say something about the extent of the **scientific knowledge** that the Indus people possessed. From what we know about their system of weights and meaures (see above, 2.3), they seem to have followed in their counting both the binary (based on numbers 2, 4, 8, etc.) and decimal systems. For their bigger numbers, they used essentially the decimal system, and for the smaller numbers and for fractions, the binary. Surviving measurement scales, complete with graduation (*Figure 2.12*), show that measurement could also be undertaken with precision. There is no proof yet, however, of the Indus people's knowledge of any geometric principles of a complex kind.

There is some evidence for astronomical observation. Though the Indus script has not been deciphered, there is good reason to believe that the 'fish' sign (no.1 in Table 2.2) as a rebus also stands for a star. A very fine seal contains the fish sign preceded by seven short vertical strokes. This could mean 'seven stars' or the Great Bear, a constellation famed for its seven bright stars (see Note 2.1). Presumably, the Indus people had not only recognized the constellation but also used its position for establishing compass directions while travelling or voyaging at night.

On the medical and surgical practices of the Indus people, we know little beyond the fact that they too practised trepanning, which we have already met with in the Kashmir Neolithic culture (*Prehistory*, Chapter 3.5). In both cases of trepanning known from the Indus civilization (skeletons of children found at Lothal and Kalibangan), the operation probably only speeded up death.

The Indus civilization cannot at first sight be admired for any great **art**. Indeed, it has often been described as a monotonously uniform, utilitarian civilization. But almost all critics have singled out two sculptured pieces for praise, both having been recovered from the Lower Town of Mohenjo

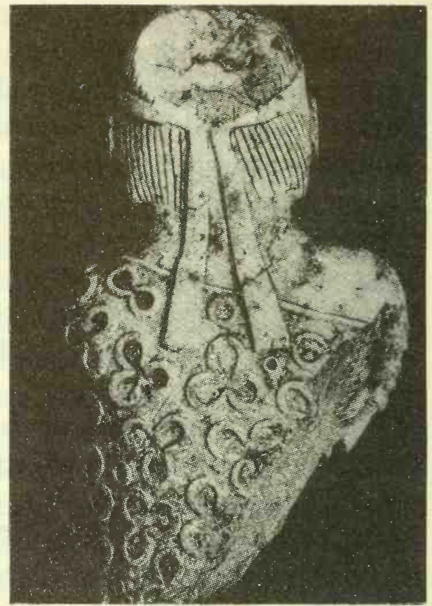



FIG. 2.16 Stone statue, 'Priest-King', Mohenjo Daro. (After A. Parpola)



FIG. 2.17 'Dancing Girl' in bronze, Mohenjo Daro. (After S. Ratnagar)

Daro. The first is a small stone statue, now about 17 centimetres high, the lower part of the body having been lost (*Figure 2.16*). The face is so finely made that it seems to be a real portrait. Close attention is paid to the back of the figure, so that it must have been meant to be seen from the back as well. The surprising features of the figure are the cut of the beard and the trefoil ornament of the robe thrown over one shoulder, since both of these recall the fashions of Mesopotamia. If it is a portrait, the subject is most likely to have been a merchant familiar with Mesopotamia, and the designation commonly given, 'Priest-King', may be misleading. There is no justification at all for the title 'Yogi', which is based on nothing more tangible than the seemingly half-closed eyes.

From the opposite end of society comes

the subject of a bronze figure called, with some play of imagination, 'The Dancing Girl' (*Figure 2.17*). Small (10.3 centimetres high), it represents a woman who holds her right arm akimbo, the left resting on her left leg slightly bent, as she stands with both legs apart (the feet are lost). The features of the face are sufficiently individual to suggest portraiture. Naked but for the bracelets she wears on her arms, especially the left, a spirit of not only animation but defiance has been read in her posture. Another noteworthy attempt to present a similar subject in bronze also comes from Mohenjo Daro: the complete but much corroded figure of a long-legged, slim, nude woman, standing erect with left arm akimbo, wearing bracelets and anklets. This figure too is not without charm and dignity.

Apart from these well-known pieces of Indus sculpture, there are others, unluckily much broken, like a male torso or a headless deer (?), both of stone, from Mohenjo Daro, which too deserve mention. Here one can see the plasticity and even realism of which the Indus artist was capable, although he might sacrifice due proportion in the interests of emphasis. These qualities are again to be found in some of the seals where the *zebu* bull (*Figure 2.3*) or the elephant is shown with lines effectively used to produce an impression of bulk and muscular strength.

The reader can see that the Indus artist seems to have worked exclusively on things of small size. There are no large sculptures, no 'monumental art'; and this clearly distinguishes Indus art from the art of Mesopotamia and Egypt. This might mean that the artists mainly worked for individuals and not for the state, or for any great religious establishments; in turn, this could tell us something about the way Indus society was organized.

From art we may conveniently pass on to **religion**, especially since, in the absence of a convincing decipherment of the Indus script, the artefacts that the Indus seal-makers and potters have left behind form our major source of knowledge about the religious life of that civilization. We have also some structural remains that might or might not have cultic or ritual significance. While studying our evidence, we should guard against any assumption that there was necessarily a single system of beliefs and ritual. It could well be that different sections of the population had their own cults and deities.

The seals and the writing that they contain might, then, possibly represent what the ruling classes, officials and merchants, who used these seals, believed in—something akin to an 'official' religion of the Indus realm. Almost three-quarters of the Indus seals carry the representation of just a single animal, which always (in the seal impression) faces right. The most common of the animals pictured on seals (on 1,150 out of 1,524 showing animals)



FIG. 2.18 'Unicorn' with 'manger' on seal, Harappa. (After S. Parpola)

and on the far fewer copper amulets is a mythical one, a 'unicorn', which is a humpless bull with a single long horn jutting forward from the forehead, always shown with a curiously shaped three-tiered 'manger' in front of it (*Figure 2.18*). Far less frequently are to be found the humpless bull or bison (95 seals), elephant (55), *zebu* or humped bull (54) (but never, significantly, the cow), tiger (21), hare (15) and buffalo (14). (Count based on I. Mahadevan's analysis.) It is likely that these animals were seen as embodiments of zoomorphic deities whose protection the seal-owners wished to invoke. It is true that the pictured animals might equally represent the totems of the lineages or clans of the seal-owners. But this could well be precisely because these animals were the zoomorphic forms of the clans' respective deities. In other contexts, as in the representations discussed in the following paragraph, the animals do not appear to have any totemic functions at all.

In a unique seal from Mohenjo Daro, a rhinoceros and water buffalo on one side, and an elephant and tiger on the other, surround a possibly three-faced seated deity in human form ('anthropomorphic'), crowned with buffalo horns (*Figure 2.19*). The so-called 'yogic' posture of the deity, with the soles of the feet facing each other, apparently imitates the way the bull-deity sits in Proto-Elamite representations. (It is as difficult to see the deity as Shiva, in his aspect of Pashupati, 'the lord of beasts' or 'protector of cattle', with none of the emblems associated with him in later Hinduism, as to identify it with the Mother Goddess.) There is a goddess shown in a cylinder seal from Kalibangan who, in a woman's body, keeps apart two spearmen from fighting, and then appears adorned with buffalo horns and possessed of a tiger's frame for her body (*Figure 2.23*). An alligator about to swallow a fish—a motif on a seal and two amulets—has, perhaps, the significance of the alligator receiving a deity's spirit,

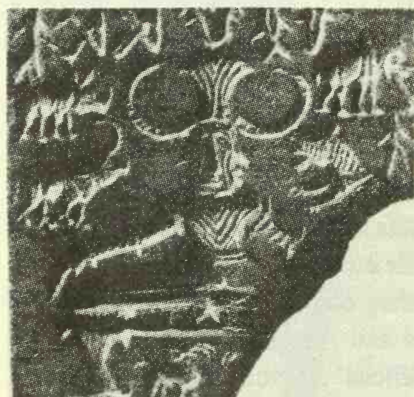


FIG. 2.19 Deity surrounded by wild animals, on seal from Mohenjo Daro. (After A. Parpola)

for the 'fish' sign (no. 1 in Table 2.2) has undoubted religious significance, meaning apparently not only fish, but light and star as well (see Note 2.1). In all these representations, the animals might, again, simply be embodiments of the deity's spirit or strength. Such favoured beings could include humans too, such as the 'hero' or 'heroine', on a seal and on tablets, who faces two standing tigers, one on each side. Such a contest with two beasts has strong parallels in Proto-Elamite Susa (southwestern Iran) and in Mesopotamia. Then there is the spearman on a tablet who is killing a buffalo by the side of a buffalo-horned deity seated in the 'bull-deity' posture (*Figure 2.4*): presumably, the animal is the appropriate sacrifice for the deity.



FIG. 2.20 Tree deity, sacrificing worshipper, markhor goat, seven priestesses. (After E.J.H. Mackay)

A tree could also receive or host a deity's spirit. *Pipal* ('the Indian fig tree') branches appear on seals, but in an elaborate scene carved on a Mohenjo Daro seal, there is a deity in the pipal tree with the 'fish' sign and a large markhor goat; the deity is being worshipped by a human worshipper with, perhaps, a sacrificial offering, while as many as seven women (perhaps priestesses) stand in line at the bottom (*Figure 2.20*). In a favourite pictorial theme on seals and clay tablets, a tiger looks back at a tree deity, representing a kind of meeting between animal and tree spirits.

The sacrificial offering on the seal just mentioned, showing the pipal-tree deity with seven 'priestesses', has been identified by many scholars as a human head. At Chanhu Daro, the excavators found a jar closely set in brickwork: it contained the skull of a woman in her early twenties. It is difficult to find any explanation for this find other than that the skull belonged to the victim of a sacrifice, its preservation in the jar being designed to propitiate a guardian deity.

This 'official' religion with its zoomorphic spirits and sacred pipal tree obviously had roots in the naturalistic beliefs of earlier times. The beliefs were still of relevance in an age when dangerous wild animals could always be met with in scrub and jungle that were never far away from most habitations. The earlier beliefs must have been reinforced by a growing stock of mythology and symbolism, orally transmitted, which today we are in no position to rediscover. No similarity with the religion and ritual of the *Rigveda* can be

discerned, and claims to see here anticipations of practices and cults (*yoga*, Shaivism) that entered Hinduism well over 1,800 years after the end of the Indus civilization can hardly be given much credit (see Note 2.2).

We are unable to say if the official cults had any shrines or temples. Wheeler identified a house in Mohenjo Daro (Lower Town) with a double staircase at the entrance as such a temple. If it was one, it must have been dedicated to the 'unicorn-deity', since the 'unicorn' is the sole animal that appears on the numerous seals found there (see above, 2.4). The statement often made that the Great Bath at Mohenjo Daro was also an official structure for ritual bathing is based on the unproved assumption that the Indus people wished to use water not primarily for sanitary purposes but for ritual purity.

Small clay-plaster-lined pits have been found at Kalibangan, Lothal, Banawali and Nageshwar, in public places as well as within some houses. These have been described as 'fire altars', charcoal being found in some of them. Such 'fire altars' have not been found at other excavated sites, notably Mohenjo Daro and Harappa, and so must, if these pits had any ritual significance, represent a regional cult. At Kalibangan, a small 'sacrificial pit' has also been claimed with ox-bones found within; and at Lothal a charred ox-jaw has been deemed sufficient to identify a mud-platform in a house as a sacrificial 'altar'. Two such doubtful 'sacrificial' altars in the whole Indus civilization are certainly too few either for propounding the existence of an ox-slaughter cult or for claiming Vedic affinities on its basis.



Fig. 2.21 'Mother Goddess' in clay, Mohenjo Daro. (After J.M. Kenoyer)

Terracotta and other figurines found in private houses may be taken as evidence of domestic superstitions and beliefs. 'Mother Goddess' figurines are very numerous (*Figure 2.21*), and far outnumber the procreative male godlings. These might have been prayed to for obtaining children. It is uncertain whether stone cones and large stone rings represent the male and female organs as symbols of a phallic cult: the utilitarian explanations that the former served for

pestles and the latter for building short, ornamented pillars, seem more persuasive.

The Indus people in the towns generally buried their dead; there is no evidence at all of cremation. Burial practices seem to have been surprisingly uniform at the cemeteries found at Harappa, Kalibangan and Lothal; bodies were laid supine, north–south, with the head usually towards the north. Some graves had mud-plastered walls; a few bodies were buried in coffins. The dead were buried wearing some ornaments and with a varying number of undecorated pots. (Earlier burials were, however, accompanied by decorated pots.) Possibly, the concept of afterlife was already losing its material aspects, so that the buried goods were usually not expensive and had perhaps begun to assume mainly a conventional or ritual form.

2.7 People, Society, State

In *Prehistory*, Chapter 3.3, we saw how people who came to the western edge of the Indus basin, as at Mehrgarh III (4300–3800 BC) in the Chalcolithic stage, moved into the Punjab, forming there the 'Hakra culture'. It is apparently the descendants of these people who inhabited the city of Harappa during the Indus civilization: cranial and dental studies of a fairly large sample of skeletons from Harappa (Cemetery R37) have indicated close affinities to the Mehrgarh III population of some 1,500 years earlier; and both have affinities with the contemporary populations of the Iranian plateau. But the Indus civilization was not necessarily a western migrants' creation, since the skeletons found at Mohenjo Daro do not bear similar affinities to those found at Harappa and Mehrgarh. Already, the Indus population was, therefore, 'biologically' diverse. Indeed, the admixture has continued since, and the Harappa skeletons bear no particular affinities to 'modern Punjabis' either.

The health of the urban populations was subject to much stress. Human stature and size of teeth have both contracted after the coming of agriculture. On the basis of a large number of Harappa skeletons, the average adult stature of men has been estimated at 1.67 metres and of women at 1.55 metres, which compares unfavourably with that of 1.80 metres for men and 1.70 metres for women at the Mesolithic site of Sarai Nahar Rai in Uttar Pradesh, of about 8000 BC (*Prehistory*, Chapter 2.5). Consumption of cultivated produce and well-cooked ('soft') food caused much dental deterioration as well. The Indus population was also subject to visitations of malaria, as shown by a study of Mohenjo Daro skeletons. This epidemic, whose presence in India is established for the first time from this evidence, must have spread rapidly in

the crowded habitations of the Indus towns. Life expectancy has apparently not yet been calculated for the Indus people; but out of 90 skeletons from the Harappa cemetery, as many as thirty-five came from the age-group 17–34 years, twenty-seven from 35–55 years, and just thirteen from over 55 years. Only fifteen are minors, that is, below 17, so that many children were not buried at all and so remain outside our data. Allowing for their exclusion, it would be surprising if the real average life expectancy exceeded 30 years.

It has been suggested from the way women of the same genetic traits are buried in the cemetery at Harappa, and from the profusion of clay 'Mother Goddess' images in houses, that a matrilinear system (where inheritance and family identity pass through the mother) was in vogue. This needs to be confirmed. But even if such a system existed, women still remained underprivileged. Dental studies of the Harappa skeletons show that, compared with the men, the women (from childhood onwards) were less well looked after and ate much less meat. From Nausharo comes a clay figurine of a woman grinding grain with a roller on a flat stone (*Figure 2.22*). The wide occurrence of spindle-whorls in the Indus houses suggests that hand-spinning too was done by women at home. Both kinds of labour, given the absence of rotary hand-mills and spinning wheels, were especially strenuous.

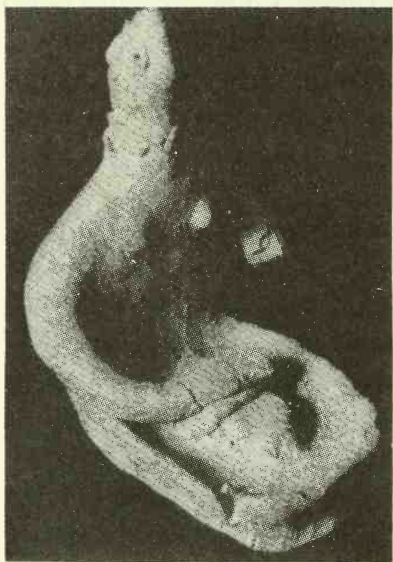


FIG. 2.22 Woman grinding grain (in clay), Nausharo.
(After J.M. Kenoyer)

That the Indus society was highly differentiated, with a great distance separating the rich and the poor, is shown by its houses: those built in large part with baked (fired) brick, around relatively spacious courtyards, with their own wells, bathing platforms, latrines, large rooms and, perhaps, quarters for servants or slaves, may be contrasted with the 'coolie lines' at both Mohenjo Daro and Harappa. That slavery existed on a significant scale is shown by slaves forming an item of exports from the Indus territories ('Meluhha') to Mesopotamia. If there were human sacrifices, then the victims probably came from the ranks of slaves.

Some other inferences about the social structure can also be drawn. The towns could have existed only if a large amount of tribute was levied on

the villages. We may suppose that such extraction could have been made through local potentates, who could have been men of means themselves. At the small rural settlement of Allahdino (inhabited area: 1.40 hectares) near Karachi, a treasure-jar full of gold lumps and ornaments, silver jewellery and agate beads gives evidence of the wealth of probably such a local potentate.

The profusion of seals is a good indicator that the concept of private property had become so widespread that any person of substance needed to have a seal to mark his property. There are pottery cups which bear seal impressions, and the clay sealings in the Lothal warehouse show how jars containing merchandise carried the owners' seal impressions. Seal finds are heavily concentrated in the two major cities: Mahadevan's concordance published in 1977 showed that 68 per cent of the seals then known came from Mohenjo Daro and 19 per cent from Harappa. This in itself may be indicative of the fact that it was in the towns that moveable property, on which seal-marks may be needed, was concentrated. If the animals on seals represent clan totems, then, it would follow that the higher classes of Indus society had a strongly developed clan system.

That merchants were among such property-owners is not only intrinsically probable, but is proved by the Lothal sealings on merchandise. If Wheeler is correct in identifying a Mohenjo Daro house as a temple, then, the unicorn seals, as well as other seals found there, should belong to priests. There is much likelihood, though no certainty, that there was a prosperous priestly class that served the 'official' religion we have described above (2.6).

Finally, perhaps, the most powerful possessors of the seals were members of the ruling class. Parpola draws attention to two hoards of copper weapons and objects found at Mohenjo Daro and Harappa: in the former a seven-character inscription found on two axe-blades matches that of a seal found elsewhere, and in the latter a curved dagger and axe-blade bear the same three-character inscription. The owners, whose name and title the inscriptions presumably bear, must have been persons of substance who possessed weapons to be used by themselves and by their retainers.

From the evidence just outlined and our knowledge about the economy of the Indus civilization (see 2.2, 2.3 and 2.5 above), we can see that it had a well-developed class society, comprising peasants, pastoral nomads, slaves, urban poor, artisans, merchants, priests and rulers, along with their dependents such as warriors, scribes and servants.

This brings us to the nature of the **state** that kept such a society together. In order to understand it, two major features of the Indus civilization must be borne in mind.

(1) The depth of state control. The way towns were planned, with straight roads, walled citadels and lower towns, and the way building encroachments on roads were prevented and road drains were maintained (and, when ruined, rebuilt, as at Harappa), show a remarkable degree of administrative control in major Indus towns for a period of about 500 years. A similar control over villages must be more indirectly inferred from the size of the towns. Without the imposition of rigorous control over peasants, and the extraction of a large part of their surplus produce in the form of tax or tribute, it is not imaginable how the towns could have been fed and clothed.

(2) An institutional uniformity, which could have emerged only from centralized control. Such uniformities are seen in the common features of town-planning and municipal administration; the standard Indus script and uniform system of weights; the use of distinctive seals; a universal style in pottery; and standard sizes of fired and sun-dried bricks. After these practices or cultural traits suddenly arose in one part of the Indus basin, around 2600 BC, they spread over the whole basin and over portions of Gujarat within a century or so (see Chapter 1.4). The only plausible factor for such spread is conquest: we may imagine that the state in the core area which initially possessed these features subjugated the other regions, one after the other. Everywhere in the different regions, the victors not only built towns suited to their own vision, but imposed their own requirements with regard to consumption goods and luxuries.

An 'Indus empire' could thus have been created. For this to happen, however, the original Indus state needed to have the armed means to both conquer and keep in subjection a large population. There is evidence for fight-



FIG. 2.23 Two warriors attacking each other with spears, stopped by a woman, while goddess with tiger's body looks on; cylinder seal from Kalibangan (impression).
(After A. Parpola)

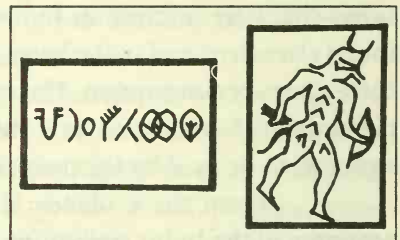


FIG. 2.24 Man with bow and arrow, on copper tablet, Mohenjo Daro.
(After A. Parpola)

ing with spears (*Figure 2.23*) and for bow and arrow (*Figure 2.24*) from seals; and axe-blades in copper or bronze have been found in some profusion. Bronze weaponry, particularly if the skill in making it was confined to towns, could have been decisive against those who had only bows and arrows and stones to throw as missiles. Nor should the light ox-cart be overlooked. A precursor of the horse-drawn chariot, it could give mobility; and a charge of ox-chariots could disperse resisting infantry. Finally, the walls of the Indus cities and citadels provided sufficient protection against possible surprise attacks by primitive opponents. It is difficult to support the view, in the face of this evidence, that the Indus state did not have sufficient military power to maintain itself and so depended on cultic rituals and the aid of priestly classes to secure popular acceptance. Still, religion might have helped to legitimize its authority in some of its subjects' minds.

The Indus civilization having had a state, must have had a political history. As we have earlier suggested (see Chapter 1.4), a large part of the Indus basin having been conquered and held for some time as a centralized 'empire', might then have broken into two or more parts, each under a separate dynasty but each owing allegiance to the same tradition of culture and governance. The same result could also occur if, let us say, Mohenjo Daro was the capital, and Harappa, Ganweriwala, Lakhmirwala and Dholavira were provincial seats, which in time became practically autonomous. On the other hand, it is difficult to see how the fortified settlement of Sutkagen-dor on the Iran–Pakistan frontier could have been maintained for such a long time without a state having the necessary will and resources; and these a small territorial kingdom was hardly likely to have possessed.

Unluckily, we can say hardly anything more about the nature of the Indus state. We do not know for certain which city was its capital at the point of initial expansion, though it is probable that it was either Harappa or Mohenjo Daro. The 'citadels' found in many settlements indicate a hierarchy of seats of power among the provincial towns; but we do not know how the channels of control actually ran. The Indus state was probably a monarchy (and, when divided, monarchies), but we cannot absolutely rule out the existence of oligarchies. Monumental buildings, whether palaces or tombs, to suit an emperor or even king of some majesty, have yet to be discovered. Possibly, the Indus script, when deciphered, may throw some light on the apparatus of the Indus state, even if only by giving the names and titles of its rulers and sub-rulers. But that day is yet to come.

2.8 The End of the Indus Civilization

The end of the Indus civilization remains as much a puzzle as its appearance. Just as many of its essential features lack anticipations or precedents in the preceding Early Indus cultures, many of these features seem to disappear with practically the same suddenness at its end. First of all, the cities and towns: soon after 2000 BC, they are just not to be found. Some, like Mohenjo Daro, Harappa and Lothal, show signs of administrative deterioration, with, as in Mohenjo Daro, private constructions encroaching on roads, the drainage system getting into disrepair, and houses being clumsily divided and sub-divided. In other towns, like Kalibangan and Banawali, the abandonment comes more abruptly. All over the Indus basin, there is no settlement of the successor ('Late Indus' or 'Post-Indus') cultures yet found, that comes even remotely near the Cemetery-H site of Kudwala Ther (in District Bahawalpur) and that is less than 40 hectares in occupied area. No settlement gives any evidence of town-planning in respect of roads or drainage. Fired bricks occur only rarely. The Indus writing disappears as inscribed seals, and the graffiti on potsherds become increasingly rare. The figures of sacred animals and deities on seals and tablets disappear altogether, even in Gujarat, where seals with Indus characters continued to be made for some time. The characteristic terracotta figurines, especially those of the Indus Mother Goddess, are also not to be found any more. There are sharp changes in burial practices, so that a radical change in religious beliefs must be assumed. Some crafts, like steatite-cutting and stoneware-manufacture, or the deliberate alloying of copper with tin to make bronze, fade away or disappear altogether. The Indus weights are no longer in use. Finally, the characteristic Indus pottery is replaced by other, generally much coarser, forms. (See Chapter 3.2 for the Late Indus cultures, described regionally.)

The change, then, was so complete as to bring about a relapse to non-urban conditions and illiteracy, an alteration of religion, and a great qualitative and quantitative contraction of crafts. All survivals from the Indus civilization within the succeeding cultures are of a minor and secondary character; and even these leave the scene fairly soon.

Many factors have been proposed to account for such a comprehensive disappearance of the Indus civilization. Floods, caused by earthquakes, were suggested as one possible cause. The traces of floods at different times were noticed by excavators at Mohenjo Daro and Chanhu Daro, both of which are near the Indus, and at Lothal, near the Sabarmati and Bhogava rivers in Gujarat. But the proposition that there was ever a flood of such volume and force as to overwhelm towns in the Punjab, Sindh and Gujarat simul-

taneously, strains one's credulity. The evidence put forward in support of the theory has been painstakingly refuted by H.T. Lambrick. Quite an opposite theory is that of increasing aridity, urged by Gurdip Singh. On the basis of his work on pollen samples from some saline lakes of northern Rajasthan, he claimed that, around 2230 BC, a wet phase was replaced by a dry one with much lower rainfall, as a result of which the Sarasvati (the name erroneously given to the Ghaggar-Hakra river) dried up. It is supposed that this caused a natural disaster of immense magnitude to Indus settlements in the Ghaggar-Hakra basin, from which the civilization could not recover. In another version of the same thesis (V.N. Misra), it was not lower rainfall but the desertion of the Ghaggar by the Yamuna and Sutlej (which were supposedly its earlier tributaries) that led to the drying up of the Ghaggar-Hakra river. (See, on these suppositions, *Prehistory*, Note 3.1.) Both versions have been refuted by further work on the Rajasthan lakes, which has shown either that no distinct wet and dry phases can be identified (as at Pachpadra and Thob basins), or that conditions of present-day aridity have in fact prevailed right from 4200 BC (such evidence comes from Lunkaransar basin, which ran completely dry as early as 3500 BC). Even if rainfall became less or the Ghaggar-Hakra ceased to be a 'mighty river' at any time, the two events must have long preceded the Indus civilization, and could have had no role to play in its end.

W.A. Fairservis replaced the argument of a natural disaster by that of a man-made one: the Indus people so much overcultivated, overgrazed and deforested the land that, in the end, the land could simply not maintain the population, especially its urban part. We have seen, however, that the Indus population could not have been denser than six persons to the square kilometre, and it is hard to imagine how such small numbers could have overused the soil to exhaustion: people could have simply moved from one spot to another, as they do in 'jhum' cultivation. There is, then, the argument that the cessation of trade with Mesopotamia after 2000 BC brought about such a decline of commerce and industry within the Indus basin as to cause the cities to go to ruin. But, first, it is not clear that the Indus–Mesopotamian trade was on such a scale as to provide the major outlet for urban crafts in the Indus basin. Secondly, one can with equal assurance argue that the trade with Mesopotamia collapsed because of the collapse of the urban economy of the Indus civilization, and not *vice-versa*.

By a process of elimination, we are left with a factor, the political one, with which we should perhaps have started. We have seen (in Chapter 1.4) that the Indus civilization could not have attained its spread or planted its special features so extensively without an initial conquest by a core-state

within the Indus basin. It is also clear (above, 2.7) that the Indus cities could not have existed without the ability of the Indus state or states to impose a heavy tribute on the rural communities. If this ability was undermined, either by internal dissensions within the ruling class or by a shift of relative armed power (by the spread, for example, of copper weaponry and ox-chariots among subject rural chiefs and communities), then, the towns could no longer obtain the tribute on which the rulers, merchants, artisans and other townsmen ultimately depended for their prosperity. The administrative deterioration at times, and certainly towards the end, noticed at Mohenjo Daro, Harappa and Lothal, would be consistent with exactly such a situation.

An external agent for the destruction of such a weakened and possibly divided Indus 'empire' cannot also be ignored. Two events, which closely preceded the fall of the Indus civilization, are very relevant here. Soon after 2200 BC, the Helmand civilization, which has left traces of a fairly strong state at its two major cities, Shahr-i Sokhta and Mundigak, came to a sudden end, and its two cities were largely abandoned (see Chapter 1.2). A still closer neighbour of the Indus civilization, the residual Kot-Diji culture, with its semi-urban settlement at Rehman Dheri (19 hectares) (see Chapter 1.3), came to an end around 2000 BC; and among its many settlements, the prosperous one at Gumla and another at Rana Ghundai were destroyed with such violence as to leave traces in the archaeological record. Similar traces of arson are found also at the Kulli-culture site of Nal and the Indus border settlement of Dabarkot. The inference, then, seems irresistible: that there were invasions from the west which overwhelmed, first, the Helmand cities, then, the late Kot-Diji culture and, finally, the Indus civilization.

In the Indus civilization itself, signs of violence were found in the late stages of Mohenjo Daro. As many as thirty-eight skeletons have been found in the most unnatural situations, lying individually and in groups in houses and even on the road, so as to suggest that they belong to victims of acts of violence (spread over a stretch of time) from invaders or marauders. This inference has been much criticized, but no alternative convincing solution has been offered. Wheeler drew on this evidence and on the intrusion of the Cemetery-H culture at Harappa, to argue that the Indus civilization fell to invaders from the west. That argument is strengthened by what we now know of the fate of the Helmand cities and late Kot-Diji settlements. His supposition that the invaders were Vedic Aryans is, however, no longer tenable, in the light especially of improved chronology. With the large number of calibrated carbon dates now available, the end of the Indus civilization in its main parts cannot be put later than 1900 BC; and this date is more than 400 years too early

for the earliest elements in the *Rigveda*, the earliest Vedic composition (see Note 2.2). That the intruders, or some of them, were 'pre-Vedic Aryans', that is, speakers of some form of proto-Aryan speech (out of which the language of the *Rigveda* developed later), is not impossible, but cannot be proved. The languages that were spoken by the peoples of the Cemetery-H and Jhukar cultures, which immediately succeeded the Indus civilization in the Punjab and Sindh, are a closed book to us. The authors of these cultures have left no particular piece of evidence at all (like the presence of the horse, for example), which might help us to link them with the early Aryan (Indo–Iranian) speakers. (See also Chapter 3.4.)

It is painful, but unavoidable, to reflect on the fate of the people of the Indus civilization at its end. As the towns were abandoned or fell to hostile elements, the people of each city might lose all their property: some hoards found in late levels at Mohenjo Daro might be the result of an attempt to hide private treasures, to which their owners were, however, never able to return. Even more, large numbers might have been seized and enslaved, so that no possibility remained of their rebuilding towns elsewhere and re-establishing commerce on the older pattern. We can dimly trace the fate of some of such hapless fugitives by reference to the Indus settlement at Daimabad, south of the Godavari in Ahmadnagar district in Maharashtra. Here, *c.* 1900–1700 BC, the Indus settlers built houses of mud-walls and mud-bricks of the characteristic Indus ratios, 1:2:4, and still made use of terracotta seals bearing Indus characters, which also appear on potsherds. It is possible that traditions from urban days of the past had now become rituals in rural poverty. Apparently preserved by them were four splendid bronzes, one of a chariot drawn by two

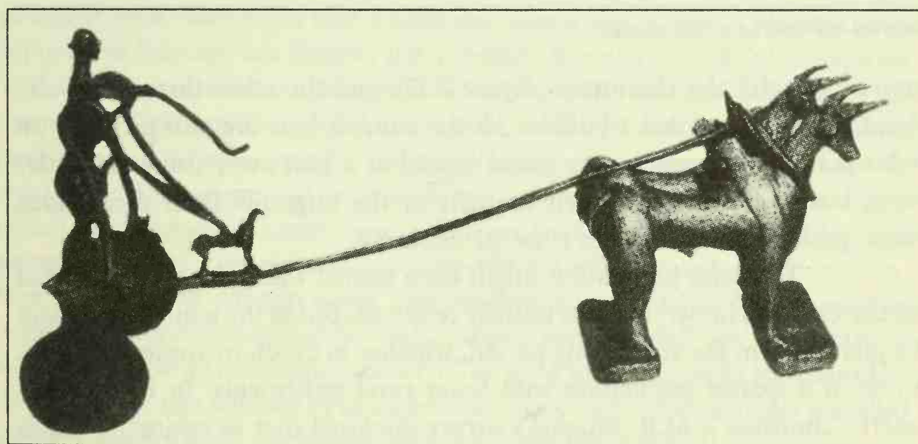


FIG. 2.25 Bronze chariot, with rider, Daimabad. (After S.A. Sali)

TABLE 2.1 Chronology of the Indus Civilization

BC	
2600–2500	Establishment and spread of the Indus civilization
2500–2000	Mature or Main period of the Indus civilization
2350–2000	Main period of Indus trade with Mesopotamia
2000–1900	Fall of the Indus civilization
1900–1700	Late Indus settlement, Daimabad
Ranges of ^{14}C (Calibrated) Dates from different Indus Sites	
	BC
Northern	
Harappa	3508–1905
Shortughai	2865–1975
Sind	
Jhukar	3660–3140
Mohenjo Daro	2650–1975
Allahdino	2555–2125
Baluchistan	
Balakot	2890–2285
Nausharo	2865-2525
Northeastern	
Kalibangan	2875–1240
Banawali	2560–1250
Mitathal	2435–1860
Gujarat	
Surkotada	2940–1700
Rojdi	2680–1850
Lothal	2655–1570

Note: Far-out dates have been omitted.

oxen along with the charioteer (*Figure 2.25*), and the other three of an elephant, a rhinoceros and a buffalo. All the animals here are also pictured on Indus seals. The bronzes were found buried at a spot away from the settlement, but had apparently been brought by the migrants from their Indus home, possibly Gujarat, if not even further away.

The rural population might have gained when the heavy hand of the tax-exacting Indus state was initially removed. But in the main Indus basin the picture from the succeeding period, whether in Sindh or western Punjab, is one of a sparser population with fewer rural settlements. In Bahawalpur desert ('cholistan'), M.R. Mughal's survey disclosed that as against 174 sites belonging to the Mature Indus period, only 50 belonged to the succeeding Cemetery-H culture. This may partly be due to the possibly shorter time-span

of the Cemetery-H culture, but may partly also represent a real contraction of population in the area. On the other hand, settlements become more numerous in eastern Punjab, Haryana and upper Doab, and in Saurashtra (see Chapter 3.2). The demographic impact of the end of the civilization might have been geographically uneven; but local depopulations and even a possible eastward migration into the Sutlej-Yamuna divide could not have taken place without much human suffering.

Note 2.1 The Indus Script

To understand the nature of the Indus script (described above, 2.6), we may begin by considering some elementary facts about how scripts have evolved in early times. We may imagine that, first of all, messages hitherto transmitted only by word of mouth, began to be conveyed also by scrawled marks. A summons to tribesmen by their chief for participation in a mass-hunt might be sent with the messenger carrying a potsherd with the rough figure of a bow and arrow scrawled on it. To those who saw it, the message would mean not just a bow and arrow, but: 'The chief summons you to come to the mass-hunt tomorrow.' If a mark was added of a half-sun with rays coming out of it, it might give the further meaning: 'Come early in the morning.' Such pictorial marks or symbols are called *pictographs* (or *pictograms*). In the two imaginary examples we have given, context or convention gave to the pictographs in question a much more extended sense than just the things they pictorially represented. In time, non-pictorial marks could be used to convey a message which could not be easily represented by a picture. Thus, for example, a cross (X) might be used to convey the sense: 'Come immediately.' A sign of this kind is called an *ideograph* (or *ideogram*). The term *logogram* covers both pictographs and ideographs.

Since the sentences or words represented by logograms were actually pronounced in speech, it was a matter of time before the logograms, besides carrying a particular sense, would also bear a particular sound, that is, have a *phonetic value.* Suppose the language was English, and a roughly drawn eye was the pictograph for 'eye'. Once pronounced, the pictograph for eye could also transmit to the hearer the sound of 'I' (first person singular), the English words 'eye' and 'I' being *homophones* (words having the same sound). The eye pictograph could, therefore, also bear the sense of 'I'. (A logogram used for an additional sense called for by its sound is called a *rebus.*) Many logograms could begin to represent sounds of both single syllables and groups of syllables. Logograms representing different syllabic sounds could now combine to form totally different words. Take the English word 'idol': it has two syllables 'i-dol', the second pronounced like 'dull'. Suppose the word 'dull' was represented by an ideograph like an exclamation mark (!). The word 'idol' can now be represented by drawing an eye sign followed by an exclamation mark. Such combined signs are called *ligatures.* When a script reaches this stage, it is called *logo-syllabic.*

Sumerian, the world's earliest script (besides the Egyptian), originating *c.* 3300 BC, was already a logo-syllabic script, and had 1,200 distinct signs, a number

much smaller than the more than 40,000 characters required by the Chinese script, which is purely ideographic. This reduction was achieved in Sumerian by increasing the number of rebuses and ligatures. When this process is completed and the language becomes purely *syllabic*, where each sign essentially represents a syllabic sound, 'eye', 'sun', 'shore', etc., the number of signs can be reduced still further. The Old Akkadian script (used from 2375 BC onwards) was syllabic and had just 120 signs ('graphemes'). ('Alphabets' would develop much later, when the consonants and vowels were separated, reducing the characters or 'letters' to a further smaller number: the English alphabet, for instance, makes do with just twenty-six letters.)

The nature of the Indus script is indicated by the number of its signs or characters. Because some characters might have had variants or might be ligatures, their precise number is hard to determine. But the characters probably number in all about 400 and do not exceed 450. This number shows that the script was not yet purely syllabic; nevertheless, it had been able to reduce the number of its characters by extensive use of rebuses and ligatures. In other words, it was an advanced 'logo-syllabic' script.

Such an inference means that even when a character appears to us to be a pictograph, it may well bear many meanings in addition to what it pictures. In our Table 2.2, sign nos 1, 2, 3, 4 and 5 can be seen to represent, respectively, fish, man, load-carrier (or labourer), jar and three jars. That the fish sign really represents fish is borne out by the picture of a fish-eating alligator in Indus art, where the fish is represented by precisely this sign. Also, the fish sign is found inscribed on a tablet shaped like a fish (to the extent of showing its eyes). But not only are there quite a few variants of the fish sign (nos 6, 7 and 8 in Table 2.2), but the fish sign itself occurs so often that it must certainly have carried other senses as well. We will presently see that this may have a significant bearing on identifying the language of the Indus script.

Further effort at understanding the Indus script has been concerned with studying the direction of the script and the arrangement of the signs or characters in the different inscriptions, in order to identify groups of characters repeatedly arranged in the same sequence and to establish the positions that various characters occupy in the texts.

The direction of the Indus script is, in fact, decisively established by the positions that certain characters have been found to occupy. Thus, sign nos 9 or 10 in Table 2.2 are often found at the right end, and nos 11 and 12 at the left end in single-line inscriptions. No. 11 is never found in the right-end position. Yet we find that no. 11 is often relegated to the second line, which is only possible if it is the terminal and not the initial sign. Also, it is on the left side in the seal impressions that the characters usually appear to be crowded, as if the engraver while coming to the end of his text found too little space remaining for him. In both cases, a right-to-left writing is to be inferred. (On the seals themselves, the text, being in the negative, runs from left to right; but the real intended text is that of the seal impression, which is right-to-left.) An overlap between signs on a Kalibangan jar also establishes that the text on it had

run from right to left. There were very few known exceptions: out of 3,463 lines of Indus inscriptions recorded by Mahadevan (omitting 190 single signs), he found 2,974 lines running right-to-left and only 235 running left-to-right. In most cases where there is a second line it also runs from right to left; only in ten known cases does a left-to-right second line follow a right-to-left first line—a practice known as *boustrophedon.* The Indus direction of writing practically excludes any connection with the Brahmi script, originating more than 1,500 years later, not only because Brahmi was purely alphabetical but also because it was written left-to-right.

Certain signs can be explained in their relation to other signs. We have seen that sign no. 5 in Table 2.2 can be interpreted as 'three jars' because the sign is written three times; when, as in no. 13, three vertical strokes precede the jar sign, one can say that this is an alternative way of writing 'three jars'. Such vertical strokes, then, might not mean rain in a pictorial representation, but stand for numerical units. The strokes, usually short, can reach up to twelve, so that larger numbers must have been written differently. Since the Indus weight system is largely decimal (though also binary), it has been proposed that sign no. 14 should read as fifteen, the lower semi-circular line standing for ten.

Contexts may also help identify certain characters. Sign no. 15 in Table 2.2 occurs eleven times (in ten of them in the initial or final positions) in seals found at Chanhu Daro, but is found nowhere else. Parpola suggests that it represents the unknown Indus place-name of Chanhu Daro. Sign no. 9, in addition to its initial position elsewhere, occurs near the end in 'ownership' inscriptions on two Mohenjo Daro axes, so as to suggest that, standing pictorially for a parasol, it signified a title of eminence (or, when doubled, as in these inscriptions, for one of great eminence).

Beyond some very provisional explorations, however, it would be dangerous to go. We would wish the script to tell us about the Indus civilization, not impose meanings on its characters on the basis of what we think its social features, beliefs and rituals were. Diverse efforts to impose a Vedic or Aryan garb on the Indus civilization through claimed 'decipherments' (for example, by S.R. Rao, Subhash C. Kak, and N. Jha and N.S. Rajaram) are not only mutually inconsistent but are ruled out by the arbitrary nature of their assumptions. This is also partly true of the attempts to read the script by giving Proto-Dravidian phonetic values wholesale to various Indus signs (as by Fr H. Heras and Walter A. Fairservis). But, perhaps, the case for Proto-Dravidian is not without some merit.

Here we may return to our fish sign (no. 1 in Table 2.2). As we have noted, it occurs so frequently in Indus incriptions that it cannot all the time just mean fish. It has been noticed that the best explanation comes if the sign is given the phonetic value of *min*, which, in the Dravidian languages (and so in the reconstructed Proto-Dravidian), represents homophones standing for 'fish', 'shining' and 'star'. The last meaning makes good sense, given the position the fish sign occupies in representations of deities on seals; and no. 16 in Table 2.2, the sole text of a seal, is actually explained by Parpola as 'Seven Stars', or the Great Bear constellation. No such corres-

TABLE 2.2 Select Indus Characters

1	Fish
2	Man
3	Porter/Labourer
4	Jar
5	Three jars
6	Variant of fish sign (no. 1)
7	Variant of fish sign (no. 1)
8	Variant of fish sign (no. 1)
9	Sign found at extreme right end
10	Sign found at extreme right end
11	Sign found at extreme left end
12	Sign found at extreme left end
13	Three jars (compare no. 5)
14	Fifteen?
15	Chanhu Daro
16	Seven Stars (Great Bear)

ponding range for the word for fish is available in Proto-Indo–Iranian (the reconstructed early 'Aryan' language). The evidence, therefore, tilts in favour of Proto-Dravidian as the more likely source for the phonetic values of Indus signs.

One dreams that a bilingual inscription with an Indus inscription set by the side of a Sumerian or Old Akkadian text might one day be discovered in Iraq, or southwestern Iran. We may then obtain the meanings and phonetic values of a few Indus characters, which could help us in finally determining the language family to which the Indus speech belonged. Once this link is established, a more extensive decipherment may, in turn, become possible. At this stage, the immense material collected

and classified by I. Mahadevan and by A. Parpola and his team would be indispensable for both testing and guiding such decipherment. All this may seem to be no more than castles in the air; but such things have happened in the past with other scripts.

Note 2.2 The Indus Civilization and the *Rigveda*

During the 1990s, an assertion began to be very widely made (and it has lately received much official encouragement), that the Indus civilization was not only Aryan, but also Vedic or even post-Vedic. Some professional archaeologists have embraced the view, though it may be quite contrary to what they had held earlier. The basic argument advanced is that the main features of the Indus civilization are quite consistent with those of the society and culture inferable from the *Rigveda*, and that the *Rigveda* itself is a much older text than has hitherto been believed, being datable to a time contemporaneous with the Indus civilization, or, better still, to a period before 3500 BC.

We shall first consider the question of the reconcilability of the *Rigveda* with what we know of the Indus civilization. Since the *Rigveda* is pre-eminently a religious text, consisting mainly of hymns to deities, the crucial area of comparison must be the religious one. We have already described in summary the evidence we have for the religious beliefs of the Indus people (above, 2.6). What the seals and copper amulets tell us is that the Indus deities were mostly zoomorphic, represented by various animals, the most prominent animal being the unicorn, the mythical one-horned humpless bull; other animals include the bison, elephant, humped bull and rhinoceros, in the order of frequency of occurrence (see 2.6). The great Rigvedic deities are, however, practically all anthropomorphic in conception (that is, idealized in human or superhuman forms); and zoomorphism is practically absent. Sarama is a dog-like female deity in a late Rigvedic hymn; but even here the contrast continues. The Indus seals give no evidence of a similar canine deity (nor is the dog itself pictured on the seals). We may note that the cow, so highly prized in the *Rigveda* and, at least at one place, deified, is not at all shown on the seals, where the honour belongs to the bull alone. The horse and camel, sought in gifts by the Rigvedic seers, are absolutely absent from the seals. On the other hand, the *Rigveda* shows no perception of the mythical unicorn or assign any sanctity to animals like the elephant, rhinoceros or tiger. The *Rigveda* has nothing similar to the 'composite' animals (tiger's body, bull's horn, elephant's trunk, for example) found on the Indus seals. Among the Indus clay figurines found in private houses, representations of the 'Mother Goddess' are particularly numerous. The *Rigveda* has no female deity that is either as prominent or similarly linked to any fertility cult. There is no Rigvedic goddess either, who has the body of a tiger, as on an Indus cylinder seal. The lack of similarity continues when one considers the ways of disposing the dead. The Indus people buried their dead, and there is no evidence at all of cremation. The *Rigveda*, on the other hand, recognizes 'cremation' as the principal method, using the word 'non-cremation' (*an-agnidagdhah*) for burial.

As against these major differences, there is urged the evidence of the 'fire altars' and two 'sacrificial' spots, with ox-bones found at Kalibangan and Lothal, and single 'fire altars' at Banawali, Amri and Nageshwar. These are taken to signify a Vedic connection, since the keeping of the fire altar and the offering of a sacrificed animal form an important part of the ritual in the *Rigveda*. But even if the excavators are right in interpreting the structures at the five Indus sites in the manner they have done, it is obvious that the 'fire altars' and sacrificial spots were only local phenomena: no similar features were at all found in the principal Indus cities, Mohenjo Daro and Harappa, and all the numerous other excavated sites. At Lothal, the alleged 'fire altars' were set up on the acropolis after it had been abandoned following the main Indus phase, leading the excavator to concede that the 'altars' did not belong to the 'official' Indus cult. It is also not clear how many of these 'altars' in individual houses and outside of them can also equally be interpreted as ovens of some sort or another. In any case, they hardly make a substantial case for any Vedic affiliations of the Indus religion, since a naturalistic religion like that of the Indus civilization could have on its own generated a cult of fire (the burner of forest and scrub, trapper of wild animals within its spreading flames, the giver of soft food). As for ox-sacrifices we have already noted (above, 3.6) that the Indus evidence for these is much too slight, for any affinity to be urged with the Rigvedic religion.

I. Mahadevan has suggested that the 'manger' which is placed before the unicorn on the Indus seals is a *soma*-filter of the type described in the *Rigveda*. Mahadevan himself believes that this shows, not that the Indus civilization was Vedic, but that the sanctity of *soma* in India and Iran (where, in the *Avesta*, it is called *haoma*, the consonant *s*, as usual, being turned into *h*) came from the Indus civilization. Even so, despite the ingenuity of the interpretation, the association with the unicorn remains unexplained; and thus, even this link with the *Rigveda* is at best tenuous and speculative.

Another widely claimed link with the Vedic religion is still less credible. The seated horned deity on a Mohenjo Daro seal recalled to the minds of the first excavators of that site, the god Shiva in his aspect of Pashupati. *Pashu* in Vedic times meant animal, including cattle; but in respect of Shiva as *Pashupati*, the word has the later specific sense of cattle. However, the deity on the Indus seal is surrounded not by cattle, but by wild animals. The way the deity squats with the soles of the feet facing each other has been compared with a 'yogic' posture. But A. Parpola has shown that this posture on Indus seals and terracotta tablets derives from the posture of the hooved bull-deity on Proto-Elamite seals from Susa, *c.* 3000–2750 BC, and has, therefore, no kinship with any yogic tradition. The practice of yoga and the different cults of Shiva are themselves not attested before the second century BC, so that any connection with the Indus civilization, which disappeared some 1,800 years earlier, is in itself most implausible.

A reason for claiming that the Indus civilization was Rigvedic has been found in the fact that the various Indus basin river names, occurring in the River

Hymn of the *Rigveda*, Book *x*, appear to have 'Aryan' roots. It is argued that had the Indus civilization preceded the *Rigveda* and been non-Aryan, it would have left behind at least some non-Aryan river names in the Indus basin. The assumption here is that when languages change, river names are yet retained; but one can easily show that such has not often been the case. In our neighbourhood, in the Tarim basin just north of the Karakoram range, the Turkic language intruded only in the sixth century AD and was not fully established until the ninth. Yet, practically all river names came to bear Turkic names: Yurung Kash, Kara Kash, Kizil Su, Yulduz, etc. There appear to be no river names left attributable to the earlier Saka, Sogdian and Tocharian languages, all belonging to the Indo–European family. One must expect a similar process of Aryanization of river names to have taken place in the Indus basin, when Indo–Aryan languages were established there. The Aryan forms of Indus basin river name in the *Rigveda*, therefore, are no proof that the Indus civilization was also Aryan or Vedic.

There is, then, the matter of the date of the *Rigveda*. Much research has gone into the relationship of the *Rigveda* with other datable texts. Among these texts, the most important are the tablets found at Boghazkoy (Turkey), some of which contain Hurrian texts of the fourteenth century BC, in which occur many words of an Indo–Aryan language spoken by the Mitanni in north Syria. (See Chapter 3.4.) Such words and names as were taken over in Hurrian show that the Mitanni rulers spoke a language so close to that of the *Rigveda* that it is not possible to consider them separated by a long stretch of time. This makes a date for the *Rigveda* outside the range of 2000–800 BC most improbable. The *Rigveda's* linguistic proximity (in both vocabulary and grammar) to the *Avesta*, the earliest Old Iranian text, provides yet another indicator of its date. Various kinds of evidence, such as the relationship of the Old Avestan with the language of the Achaemenid inscriptions, the occurrence of Iranian names in Mesopotamian inscriptions, the extent of linguistic changes in the *Young Avesta*, and the geography of the *Avesta*, all help to date the *Old Avesta* to no earlier than 1300 BC, and probably close to 1000 BC. Given this range of dates for the *Avesta* and its kinship with the *Rigveda*, no part of the *Rigveda* itself is likely to be earlier than 1500 BC.

The other means furnished for dating the *Rigveda* is provided by archaeology. In the *Rigveda*, the domesticated horse, drawing the chariot, enjoys a particularly prominent place. The presence of the domesticated horse on the borders of the Indus basin is firmly established only after 1700 BC. If, then, the horse became widespread in the area of the *Rigveda* (Afghanistan, the Punjab and the upper Gangetic basin) only after 1700 BC, the *Rigveda* could not have been composed before this date.

The proponents of an 'Aryan' Indus civilization seem generally to reject the entire method of dating by linguistic comparisons. As for the horse, they insist on its presence in the Indus civilization (on which, see above, 2.2); two enthusiasts even invented the evidence by forging a horse on a fragmentary Indus seal—a fraud only exposed by diligent scholarship. These deplorable methods apart, the positive arguments advanced for a very early date for the *Rigveda* are two-fold: the Sarasvati river and astronomical data.

The *Rigveda*, it is argued, treats the Sarasvati as a great river. It could only have been such a stream if there was then much greater rainfall, or if the Sutlej or Yamuna were its tributaries. Such a situation could not have existed after 2230 BC when, according to Gurdip Singh's undersoil pollen analysis of Rajasthan's saline lakes, the present dry phase began; and, therefore, the *Rigveda* should be placed before that date. We have, however, seen (above, 2.8) that this dating of the dry and wet phases is now obsolete, and nothing can be built on it. There are many other reasons also to believe that the present Sarasvati could never have been a great river and that wherever the *Rigveda* styles the Sarasvati as a great river, it has the mythical river of the goddess Sarasvati in mind, not the Siwalik stream (see *Prehistory*, Note 3.1).

The other argument takes recourse to the dating of astronomical phenomena supposedly described or implied by statements in Vedic texts. This argument usually assumes, against all contrary evidence, a uniform terminology over time (for *nakshatras*, stars, which later meant lunar mansions, for example), and the most implausible feats of astronomical observation (for example, the exact determination of equinoxes and even a knowledge of their 'precession') in the Vedic texts, in order to obtain ostensible references to astronomical phenomena of great antiquity, and to use these to fix the time of the composition of the texts themselves. How unrealistic all of this is may be judged from the fact that neither in the four Vedas (*samhitas*) nor in the *Brahmanas* are the equinoxes even mentioned, and that the *Vedanga Jyotisha*, a late 'Vedic' astrological text, holds that the longest and shortest days stand in the Babylonian ratio of 3:2 in terms of duration, quite unmindful of the fact that the ratio varies with the latitude! It is, therefore, not surprising that a very wide range of dates is possible from the various astronomical tests, all equally unreliable. While some date the *Rigveda* to 4500 BC (even preceding the Copper Age!), and the *Aitareya Brahmana* to 3500 BC, on the basis of the alleged astronomical situations deducible from their statements, other exercises of the same genre have led to dates for the Vedic corpus that are much later than 1500 BC.

The thrust of acceptable evidence as it stands is thus fairly clear: the Indus religion bears no trace of the beliefs of the *Rigveda*; and the *Rigveda* itself is considerably later than the Indus civilization.

2.3 Bibliographical Note

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3
Non-Urban Chalcolithic Cultures, till 1500 BC; Language Change

3.1 After the Cities

We have seen (Chapter 2.8) that after 2000 BC, cities disappear from the archaeological map of India. There is no settlement larger in size than Kudwala Ther (less than 40 hectares) in Bahawalpur, dating to the immediate aftermath of the Indus civilization, and it too has no known competitor. In areas outside the Indus basin, the size of the largest settlements is quite small, and it is difficult to suppose that any one of these could really claim to be a town.

It may perhaps be best, first, to sum up what we know of the changes in the material aspects that took place within the 500 years that followed the fall of the Indus civilization, along with the disappearance of town life. The summing up anticipates the information we are going to present in 3.2 and 3.3 below.

(1) In agriculture, the period 2000–1500 BC is marked by the presence in India of a much larger number of cultivated crops than before, with those known earlier appearing in areas where they were not previously cultivated. All such crops are listed in Table 3.1, with their scientific names, to assist identification and comparison.

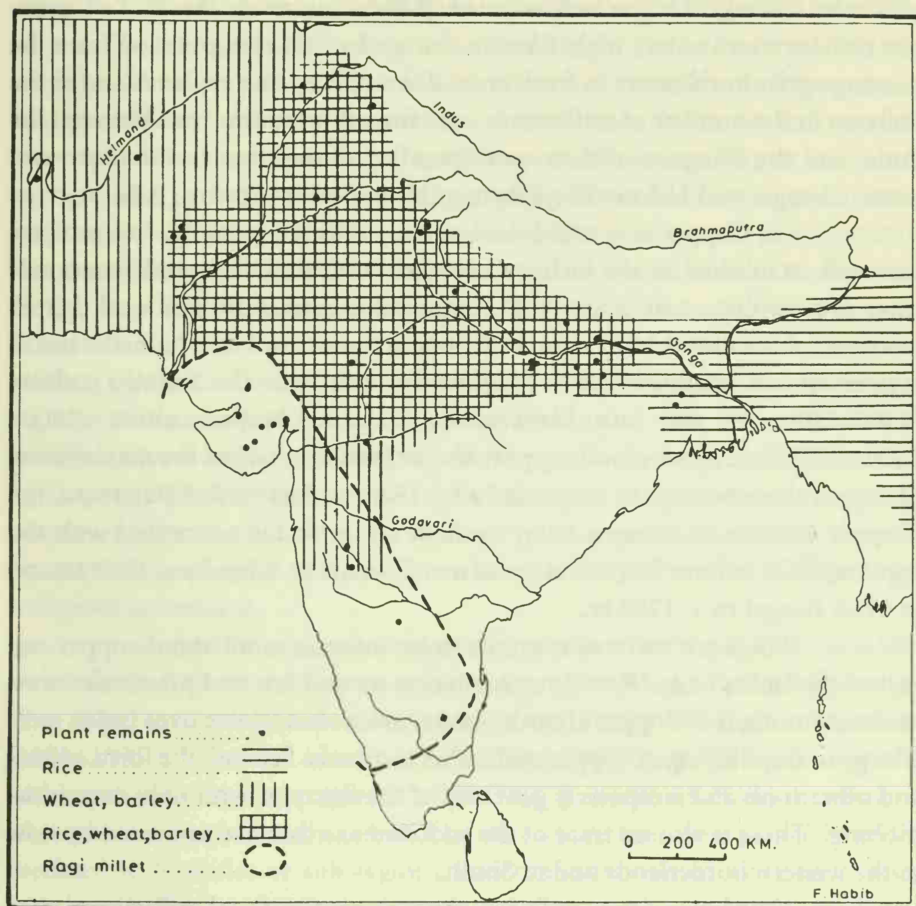
In the account of the various Chalcolithic cultures that will follow (in 3.2 and 3.3), we will see that with many of the foodcrops listed in Table 3.1 being widely cultivated, there was a crucial change from the time of the Indus civilization. If, before 2000 BC, rice was cultivated in the eastern Vindhya region, Bihar and Bengal (*Prehistory*, Chapter 3.4), it was now being cultivated also in western Madhya Pradesh, Rajasthan, western Uttar Pradesh, the Punjab, the Kachhi plain, Kashmir and Swat. Its position as a major 'kharif' crop was filled in Gujarat, Maharashtra and South India by the millets, especially 'ragi'. The principal 'rabi' crops, wheat and barley, had similarly extended to all other areas, except for Bengal, Gujarat and South India. In Bengal, however, rice crops are harvested twice or more times in a year,

TABLE 3.1 Cultivated Crops, 2000–1500 BC

Rabi	
Wheat	*Triticum vulgare*, which includes *Triticum aestivum*, bread-wheat. Other varieties cultivated included *Triticum compactum*, club or dwarf-wheat, and *Triticum sphaerococcum*, shot-wheat.
Barley	*Hordeum vulgare*, including *Hordeum vulgare nudum*, both six-row; also *Hardeum sphaerococcum* (six-row 'shot'-barley)
Oats	*Avena sativa*
Gram	Common gram, chickpea. *Cicer arietinum*
Lentil	'Masur'. *Lens culinaris/esculenta.*
Pea	Field-pea. *Pisum sativum*
Grass-pea	'Khesari'. *Lathyrus sativus*
Bean	Garden-bean. *Vicia faba*
Linseed	*Linum usitatissimum*
Mustard	'Sarson'. *Brassica campestris*
Kharif	
Rice	*Oryza sativa*
Green-gram	'Mung'. *Phaseolus radiatus*
'Cheena'	Common millet. *Panicum miliaceum*
Jowar	Indian or great millet. *Sorghum vulgare*
Ragi	'Marua'. *Eleusina caracona*
Bajra	Bulrush or spiked millet. *Pennisetum typhoideum*
Little Millet	'Kingu'. *Panicum miliare*
Foxtail or Italian millet	'Kaun'. *Setaria italica*
Horse-gram	'Kulthi'. *Dolichos biflorus*; also another variety, black-gram, *Dolichos uniflorus*
Cow-pea	'Lobiya'. *Vigna catjang*
Cotton	*Gossypium*
Sesame	'Til.' *Sesamum indicum*

Note: The foxtail millet ('kaun'), already cultivated at Balathal before 2000 BC, is of some interest since, unlike the tropical millets ('jowar' and 'bajra') traced to Africa, it is a 'temperate' millet, whose original centre of domestication was north China, where it began to be cultivated around 5000 BC.

MAP 3.1 Double Harvest Agriculture, 2000–1500 BC



so that the need of a 'rabi' collection is removed; and in Gujarat, lentil and peas could have served as 'rabi' crops. One is not very clear about conditions in South India. (See *Map 3.1.*)

We have seen above (Chapter 2.2) that, with the limited number of crops available for cultivation in the Indus civilization, a proper balance between 'rabi' and 'kharif' harvests was not probably established, with food-crops having to be sown also in the season for which they were not suited. This condition was now largely rectified. As was the general practice before modern times, when the pressure of land was not so intense, the 'kharif' and 'rabi' crops must have been entirely raised in separate fields, the land in each remaining fallow for the rest of the year. We have no indication yet of any complex system of crop rotation. In such circumstances, we can imagine that

there was a larger area of land needed by each peasant for his separate 'kharif' and 'rabi' sowings. This, as well as the need of certain newly introduced crops, like rice, for more water, might have encouraged a shift of population from the existing agricultural zones to fresh ones: this could be one explanation for the increase in the number of settlements near the sub-montane tract between the Sutlej and the Ganga, and their corresponding diminution in the more arid lower Ghaggar and Hakra valleys during this period (see below, 3.2).

(2) Copper-use, which had initially diffused from the Indus basin, was well established in the Ochre-Coloured Pottery ('OCP') and Banas cultures of Rajasthan, with apparently considerable exploitation of local copper resources, from about 2800 BC or even 3000 BC onwards. From here, the use of copper spread southward into Madhya Pradesh with the Kayatha culture (2400–1800 BC), and into Maharashtra with the Malwa culture (1800–1400 BC). A few copper objects appear also in South India, but the major influx of copper there belongs to the period after 1500 BC. Eastward of Rajasthan, the 'Copper Hoards' of western Uttar Pradesh are probably connected with the regional OCP culture (*c.* 2000 BC); the metal occurs in Bihar by *c.* 1800 BC and in West Bengal by *c.* 1700 BC.

There are two major points to be borne in mind about copper-use east of the Indus basin. First, bronze objects are still few and practically non-existent among the 'Copper Hoards'; and there is no advance over Indus metallurgy in the alloying of copper with other elements. Second, the form of axes and other tools and weapons is generally of the flat type, with only occasional 'ribbing'. There is also no trace of the socketed axe that had appeared by now in the western borderlands and in Sindh.

(3) Along with metallurgy, there was a territorial diffusion also of other techniques, such as pottery turned on the fast wheel and faience-manufacture. But the technological level was generally far poorer than in the Indus civilization. In construction, burnt bricks were a rarity, and no structures remotely comparable with those of the Indus civilization are found. Many crafts, such as stoneware-manufacture, disappeared, and the making of beads of semi-precious stones declined almost to insignificance. Steatite seals were supplanted by terracotta seals, and it is not clear if their use was for the same purposes. Not only was there a total eclipse of trade with Mesopotamia, there is also little convincing evidence of long-distance trade on any significant scale within the country.

The conditions that ensued after the Indus civilization thus show symptoms of both progress and retrogression. Progress is indicated by the increase in the inventory of crops, leading to a possibly full-fledged double-

harvest agriculture; by the expansion of Chalcolithic cultures, ultimately covering the bulk of the country; and by the spread of some craft skills and techniques. The retrogression is shown in the decay of town life ('de-urbanization'), the decay in craft skills, and the drying up of channels of commerce. In the light of what we have said about the Urban Revolution becoming possible once agriculture began producing a sufficient surplus (see Chapter 1.1), such retrogression in town life despite the coming of double-harvest agriculture and the spread of copper-use may seem surprising. We need to remember, however, that larger agricultural surplus and the spread of craft techniques, though a necessary condition for the rise of towns, did not yet constitute a sufficient condition. As we saw in Chapter 1.4, the Indus civilization needed a political reorganization for its formation; and this probably involved the coming into being of a particular kind of social structure, and the prevalence of certain kinds of beliefs and customs. If, among the cultures that followed it, the 'superstructure' was different—if, for example, the rulers and chiefs held sway over only small communities—then, quite possibly, the limited surplus extracted from the peasants would not be so employed as to encourage town crafts and commerce.

Unfortunately, archaeology only tells us mainly about material life, and we have little to draw upon as far as the state and society are concerned. That there were states and rulers, we need not doubt. Balathal in Rajasthan (3000–2000 BC) boasted of a fortified enclosure of about 500 square metres, with mud-walls nearly 5 metres in width. But, generally speaking, monumental structures are practically absent. The states, therefore, were probably small, confined to localities or sub-regions, economically isolated from each other with low levels of trade. On societies, our information is equally poor. These were not egalitarian: different sizes and structures of houses and huts bear witness to differences of status. But we do not know how precisely the different classes in society were constituted. Religious beliefs are likely to have diverged with localities, and it may be unrealistic to attempt a composite picture from what clay figurines and modes of burial in the different cultures tell us.

If the collapse of the Indus civilization took place at the beginning of this period, its close saw another change, equally momentous: the arrival of Indo–Aryan languages. The context for this is furnished by the western borderlands, which began to use three newly domesticated animals. The Bactrian camel might have been domesticated earlier, but the evidence for it becomes fairly abundant at Pirak, which also provides evidence for the donkey. By 1500 BC, evidence for the domesticated horse comes from Swat as well as Pirak. Not only did these animals greatly ease problems of pack-transport, but the

MAP 3.2 Copper Age Cultures, *c.* 2000–1500 BC: Major Sites



horse also had considerable military significance. It could draw a fast-moving chariot and carry a rider, who might now have been wielding a socketed axe (see 3.2, below). Such developments could have generated an eastward movement of militarily powerful tribes into the Indus basin. Owing notably to their possession of the horse, these tribes can justifiably be taken to be Indo–Aryan speakers, very much like the Mitanni, the speakers of an Indo–Aryan language in upper Mesopotamia (1500–1300 BC). (See below, 3.4.)

3.2 Chalcolithic Cultures of the Borderlands and the Indus Basin

The Helmand civilization, which collapsed earlier than the Indus civilization (see Chapter 2.2), had no single identifiable successor. At Shahr-i Sokhta the inhabited area shrank to 5 hectares, and this 'post-urban' settlement (*c.* 2000 BC) also soon disappeared. At Mundigak, in Period V, habitation shrank, though there were still resources enough to build a massive structure of unbaked brick. However, in a technological relapse, handmade black-on-red painted pottery replaced the earlier wheel-turned pottery. The story was, however, a little more complex to the east, in the Indian borderland.

In the Swat valley in the hills of NWFP, cultural change is manifested in the establishment of what may be called either **Swat** Culture IV (with its type-site at Ghalighai or Ghaleghay), or the Early (Bronze) Phase of the Gandhara Grave culture. The culture is datable by radio-carbon tests to *c.* 1800–1400 BC. Along with stone tools, there are tools and weapons made of copper, hammered and cast. It has pottery turned on both slow and fast wheels. The houses are stone-walled. The range of crops included wheat (bread and shot), barley, rice, oat, lentil ('masur') and linseed; the grape was also grown. The people kept (and ate the meat of) cattle, goats, sheep and pigs. Black-on-red paintings on potsherds at Birkot Ghundai clearly depict the horse (*Figure 3.1*), and bones of the domesticated horse and donkey have also

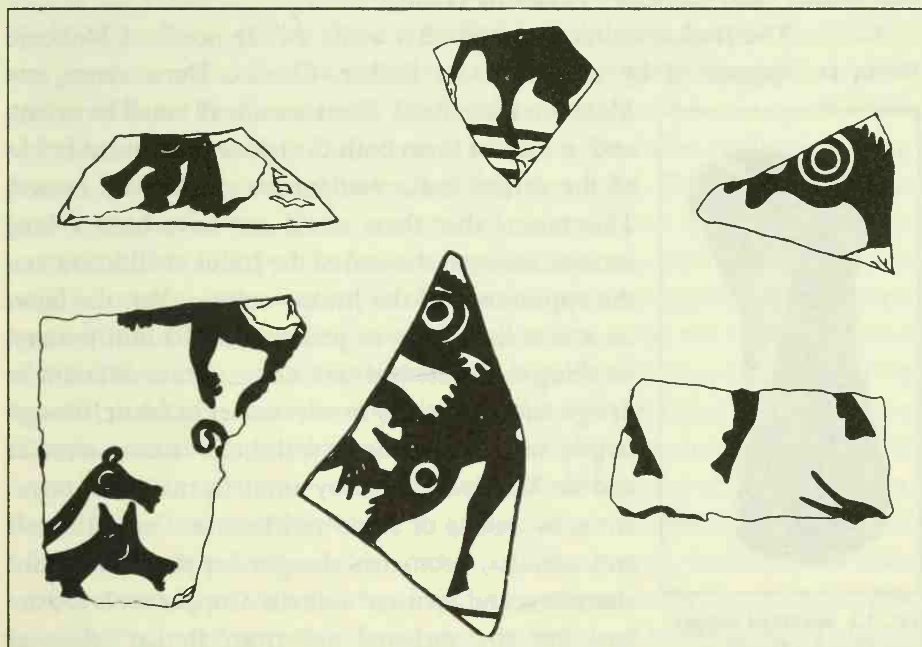


FIG. 3.1 The horse on Swat culture potsherds, Birkot Ghundai. (After G. Stacul)

been found at the same place. The dead were buried horizontally, with the knees drawn up. The pottery had affinities with that found in sites of the Dashli Bronze culture of northern Afghanistan (2500–1500 BC), and the burial customs too have parallels in northern Afghanistan, *c.* 1500 BC.

To the south, in the Kachhi plain of northeastern Baluchistan, at Sibri, sharing the same culture as Mehrgarh VIII Cemetery (2100–1400 BC), a shaft-hole bronze axe-adze has been found. At the neighbouring site of **Pirak,** there was a gap after the abandonment of the Indus settlement. Thereafter, a new culture appeared, *c.* 1800 BC, whose early two Bronze phases lasted until 1300 BC. The bulk of the pottery was now coarse, and as at Mundigak V, mostly handmade. At both Sibri and Pirak we have evidence of numerous crops being cultivated: among the 'rabi' crops we have wheat (bread and shot), barley (all three six-rowed varieties), oats, chickpea and linseed; and the 'kharif' included rice, two millets ('jowar' and 'cheena') and grape. The domesticated animals include *zebu* cattle, goat and sheep. Clay figurines from Pirak Period Ib (*c.* 1600–1400 BC) attest the presence of horses and Bactrian (two-humped) camels, although horse-bones actually found belong to Period III (*c.* 1300–800 BC).

In the main Indus region (the Sindh and Punjab provinces of Pakistan), the Indus civilization had immediate successors in the Jhukar culture (Sindh) and Cemetery-H culture (Punjab).

The **Jhukar** culture, named after a site a little north of Mohenjo Daro, is represented by settlements at Jhukar, Chanhu Daro, Amri and Mohenjo Daro itself. The sites are all small in extent, and in each of them both the houses and burnt bricks of the earlier Indus settlements are heavily reused. This means that there could not have been a long interval between the end of the Indus civilization and the appearance of the Jhukar culture. Yet, the latter took over little from its predecessor. Its buff pottery, recalling the Amri-Nal tradition, is quite different in design and is generally much coarser in fabric, though largely wheel-made. Seals with boss become circular and are largely replaced by amulets, mainly of terracotta, as well as of stone and faience. On both seals and amulets, geometric designs supplant the Indus characters and pictured animals. Copper tools too are few, but the socketed axe from Jhukar levels at Chanhu Daro (*Figure 3.2*) immediately invites com-

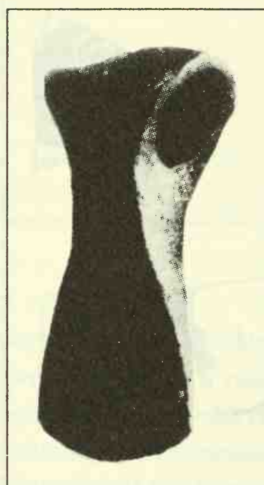


FIG. 3.2 Socketed copper axe, Chanhu Daro.
(After E.J.H. Mackay)

parison with the bronze socketed axes from Sapalli Tepe on the Oxus (2190–1690 BC) and Mundigak (see Chapter 1.2) and similar axes from Shahi Tump Cemetery in western Baluchistan (*c.* 1500 BC), and Sibri (pre-1500 BC), and suggests that the socketed axe-and-adze found in unstratified levels at Mohenjo Daro (see Chapter 2.3) might also belong to its Jhukar phase. If so, this culture, however, poorly equipped in other respects, introduced a new and effective tool (and weapon) into the Indian subcontinent. There is no information about the crops cultivated, though it is hard to believe that the crops known to peasants in Pirak were not known to those in Sindh. It is still difficult to explain, however, why the Jhukar culture is represented by only a handful of small settlements, indicating a very sparse rural population in Sindh at the time. In the absence of carbon dates it is not even certain whether the culture, having its beginning around 2000 BC, survived until 1500 BC; and if it did not survive, we do not know what came immediately after it in its area (a 'Pirak Phase' in Sindh is not attested).

The **Cemetery-H** culture is named after 'Cemetery-H' at Harappa, where the pottery associated with this culture was first found. Some debris intervened between this cemetery and the Indus Cemetery R37, so that there was apparently a time-interval between the two cultures. But the interval was not long, since the Cemetery-H people began to build over the ruined buildings in the Harappa acropolis. They even built some drains and used baked bricks of smaller sizes than those of the Indus civilization; but the construction was poor, the walls being of single brick only. The pottery belonged to an altogether different tradition: it has a much finer fabric, and is of a much darker red tone in colour. Most crafts and products of the Indus civilization disappeared, including seals and the writing they contained. The production of one luxury article, faience, however, survived. A small pot, dated to *c.* 1700 BC, recovered from Harappa, contains a small glass bead, red-brown in colour; it might, however, be an import, since glass was being manufactured in Mesopotamia by 2100 BC. Copper objects are present, but it has not been established whether the deliberate manufacture of bronze (by alloying copper with tin) was still practised. Analysis of soil, brick and pottery samples from Cemetery-H remains at Harappa led a Japanese team to the conclusion that rice and the finger millet ('ragi' or 'marua') were now added to the list of cultivated crops. Burial forms and painted pottery in graves show a change in religious beliefs from Indus times. In the earlier stratum of Cemetery-H, burials of the Indus type continued, but with different body orientations; in the later stratum, fractional burials predominate, that is, we have burials of bones gathered after an initial exposure of the body and then put in large pottery urns. Animal forms

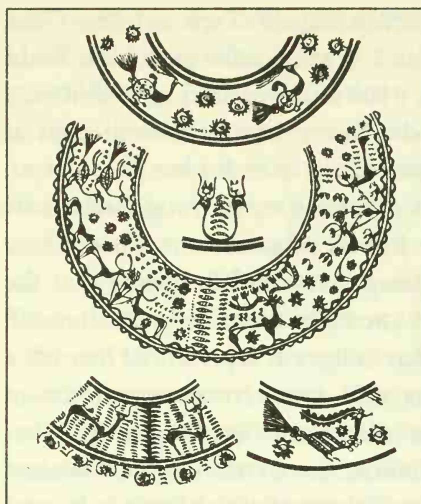


FIG. 3.3 Designs on Cemetery-H pottery, Harappa. (After M.S. Vats/S. Piggott)

painted on grave pottery are highly stylized, and while some themes may appear similar, the composite animals (for example, flying peacocks with antelope horns) are quite different from those painted on Indus pottery (*Figure 3.3*).

Fifty sites of the Cemetery-H culture have been identified in a survey of Bahawalpur district. This, compared with the 174 sites of the Mature Indus culture, suggests a contraction of settlements and population. The largest site, Kudwala Ther, on the terminal branch of the now dry Hakra river, had a habitational area of 38 hectares, and is, perhaps, the only possible town known from the post-Indus period (see above, 3.1).

The Cemetery-H culture might have been much more extensive than is indicated by its sites in Pakistan's Punjab. There are good reasons for believing that what goes by the designation **'Late Harappan'** on the Indian Union side is really either identical with, or closely allied to, the Cemetery-H culture, and is, in any case, post-Indus, not 'Late Indus'. Cemetery-H pottery is found at Bhagwanpura and Mitathal in Haryana along with an inferior but obviously cheaper pottery, designated 'Late Harappan'. This was a red ware, plain and painted, showing some influence of Indus forms, like dishes on stands; but the dominant painted motifs, vegetal and geometric, are generally quite different. It mixes with other local pottery traditions, like the one named after Bara in the Punjab, and is itself located at a number of sites in the Punjab, Haryana and the upper Doab in Uttar Pradesh, and covers a long period of time. The dates obtained by both radio-carbon and thermoluminescence methods diverge considerably, but broadly, a period from 2000 to 1200 BC seems indicated for this pottery.

Among the excavated sites of this culture, Hulas, with exceptionally early carbon dates, is important because of the evidence it has provided for the large number of crops. The 'rabi' crops include wheat (shot and bread wheat), barley, gram, lentils, oats, grass-pea and field-pea; the 'kharif' crops are represented by rice, jowar, ragi, cow-pea, green-gram, horse-gram and cotton. Terracotta cart-wheels (as toys) attest the making and use of ox-carts. But baked bricks disappear, and even sun-dried mud-bricks become rare. Houses

or huts were now built of walls of heaped-up mud or possibly bamboo, and thatch frames daubed with mud ('wattle and daub'). The crafts of the Indus civilization were obviously on the decline: the finds of cornelian and agate beads become rare; only the faience industry appears to have survived. No seals are found; and Indus characters on a pot at Alamgirpur and a sealing in Hulas are all that remind us of Indus writing. Clearly, the religious beliefs evidenced by the Indus seals and the pictures they bore, were also no longer held. At Bhagwanpura, burials within habitational sites are reported—a total departure from the Indus custom of having burials in cemeteries outside the inhabited area.

Even if some traits of the Indus civilization survived for some time within the 'Late Harappan' culture, its character was different: it was entirely rural, with not much evidence of trade and industry. The number of its settlements so far identified within the Indian Punjab, Haryana and northwestern Uttar Pradesh exceeds 500, though many of these are so different from each other as often to have practically no affinity beyond certain shared pottery forms. Nonetheless, the profusion in their number, as compared to the sparseness of settlements in Pakistan's Punjab and Sindh during this period, may represent a real increase in population in the region of this culture. The increase might partly have come through migration: the newly introduced rice cultivation could well have induced some communities settled on the banks of the Hakra and Ghaggar to move up to lands along the upper reaches of the streams in the Sutlej-Yamuna divide and to the upper Doab, where the floodlands would have been more extensive and the rainfall heavier to provide suitable conditions for rice cultivation.

In **Gujarat**, the archaeological evidence is complex and subject to some dispute. The stratification established for the important site of Rangpur has been questioned. Still more disputed is the position of Rojdi in central Saurashtra. Rojdi has Indus pottery, but no seals. Its early carbon dates persuaded its excavator to treat it as representing a sub-culture ('Sorath Harappan') within the period of the Indus civilization; others have seen it as a simple Mature Indus site; others still, disregarding the carbon dates, deem it 'Late Indus'. It seems best, therefore, to trace the impact of the collapse of the Indus civilization in Gujarat on the basis of sites whose cultural strata are more firmly established. Lothal IV represents vividly what the situation of an Indus community must have been, once the political system which had sustained it disintegrated. The acropolis was abandoned by the previous residents (presumably officials, priests and the garrison); it was occupied by poorer people, bone-workers and the like, who put up inferior structures with reused bricks.

The warehouse went into decay. In the next phase (Lothal V or B), the seals continue, but no longer carry the figures of animals. Houses were built of mud and reeds, and no trace is found of the cornelian and agate industry. A similar situation developed at Dholavira. In its Stage V, the civic administration showed signs of collapse, and the town was even abandoned for some time. When it was reoccupied (Stage VI), seals were used with Indus characters but without any pictorial representations, just as at Lothal V. The Indus pottery continued but with additional wares, some of which resemble those of the Jhukar culture. Another abandonment followed for a century or so. In Stage VII, houses became circular (the Indus form being rectangular), built of reused bricks. Seals had by now disappeared, though some pottery forms continued. A third site, Bet Dwarka, on the northeastern tip of Saurasthra, known only from the 'Late Indus' phase, with a thermoluminescence date of 1570 BC, had 'Lustrous Red Ware', a new post-Indus ware. A jar with corrupt Indus characters and a seal with a three-headed animal have been found there.

The decay of the Indus civilization in Gujarat looks far more gradual than its collapse in the Indus basin, and seems to be the result more of a break with its core-area than of a forcible supplanting by another culture. Nonetheless, there was much internal upheaval, and by about 1600 BC, new rural cultures had taken over. Two such cultures have been identified, one named after the Lustrous Red Ware just mentioned and the other by the type-site of Prabhas Patan or Somnath.

There is no evidence of rice being cultivated in Gujarat during the Late or post-Indus times. The main crops, to judge from the Rojdi evidence, were millets (ragi, bajra, jowar), all of them 'kharif' crops, but these could at least partly have been supplemented by the lentil and pea, which were 'rabi' crops.

3.3 Other Chalcolithic Cultures, to *c.* 1500 BC

To the north of the Indus basin, the Kashmir Neolithic culture (described in *Prehistory*, Chapter 3.5) entered its final (third) phase (2000–1500 BC) around the time of the collapse of the Indus civilization. A coarse red ware replaces older pottery, and a megalithic (large stone) circle has been found at Burzahom. An arrowhead from Burzoham, end of Phase 2 (*c.* 2000 BC), and a hairpin (?) from Gufkral represent intrusions of copper. Cultivated rice is reported from Gufkral, adding to the earlier crop-list of wheat, barley, lentil and field-pea.

We saw, in *Prehistory,* Chapter 3.4, that some areas immediately to the east of the Indus civilization, in Rajasthan and northern Gujarat, were still

Mesolithic (with sites at Bagor and Langhnaj), and had not even entered the Neolithic stage. But the proximity of the pre-Indus cultures and then of the Indus civilization helped to spread the use of copper and, on its basis, arose two new cultures, the OCP and Banas cultures.

The **OCP** culture, so-called after its Ochre-Coloured Pottery, has its major sites in Jodhpura and Ganeshwar in northeastern Rajasthan, while the pottery has also been found at sites in western Uttar Pradesh (such as Atranjikhera and Lal Qila), and carbon and thermoluminescence dates place it within the period 2800–1500 BC. The sequence established at Ganeshwar shows that the first stage of the OCP culture followed a Mesolithic phase without any pottery. It now had pottery that was largely handmade and only partly wheel-made, with few copper tools. But in the final stage of the OCP culture, probably beginning even before the period of the Indus civilization, over 90 per cent of the artefacts are of copper (with practically no tin). This was undoubtedly due to the exploitation of the famous Bairat-Singhana copper mines of the area.

The discovery of this culture has largely solved the mystery of the copper hoards, containing generally flat copper tools and weapons but also ribbed swords and spearheads, found in large numbers in western and central Uttar Pradesh and associated with the OCP (the connection is reasonably well established at Saipai in western Uttar Pradesh) (*Figure 3.4*). At Atranjikhera, the use of burnt bricks as well as mud-bricks, with some features linking its pottery with early Indus wares, suggests indirect Indus influences. The crops cultivated included barley and two legumes (gram and khesari), all these being 'rabi' crops. Rice was apparently the mainstay of 'kharif' cultivation here.

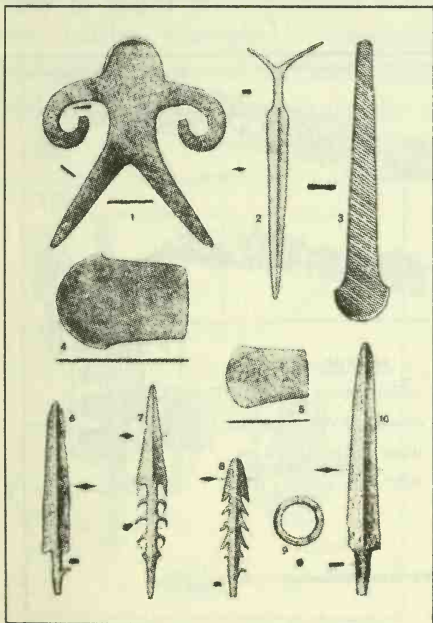


Fig. 3.4 Weapons and tools from the Doab copper hoards. (After B. and R. Allchin)

Ahar, at the head of the valley of the Banas (a tributary of the Chambal) in southcentral Rajasthan, is the type-site of a culture known as the **Banas** culture. Carbon dates suggest a span for the culture from about 3000 to 1300 BC. (At Balathal, the dates give the range *c.* 3000–2000 BC.) The characteristic pottery of the culture is a black-

and-red ware, with white-painted decoration. At Ahar, copper is the only material for tools and there is evidence of copper-smelting. There were copper mines nearby, such as Rajpur Dariba, yielding carbon-dated material of the range of 1545–1100 BC. Yet, at Gilund there seems to have been a brisk stone industry; so, stone tools must also have been used. Evidence from Balathal attests the cultivation of wheat, barley, the common and foxtail millets ('cheena' and 'kaun'), black and green-gram, pea and linseed, all before 2000 BC, while at Ahar the evidence for rice and millets (jowar and bajra) comes from sherds not datable before 2000 BC, except for one (for rice), which may be still earlier. Stones and mud-bricks, along with earth and thatch, were used to build houses (*Figure 3.5*).

Further to the south, in Malwa (western Madhya Pradesh) in the upper Chambal valley, a culture was discovered at **Kayatha** and has been carbon-dated 2400–2100 BC. It has rather primitive pottery (85 per cent hand-made) but is otherwise Chalcolithic, a number of copper artefacts having been found. The caches of cornelian and agate beads and of steatite beads do not probably represent local manufacture, but imports from the Indus territories. Kayatha subsequently had a 'Banas Phase' (2100–1800), in which Banas-culture pottery appears: terracotta figurines of this time suggest the existence of a bull cult.

A major Chalcolithic culture that extended over much of west

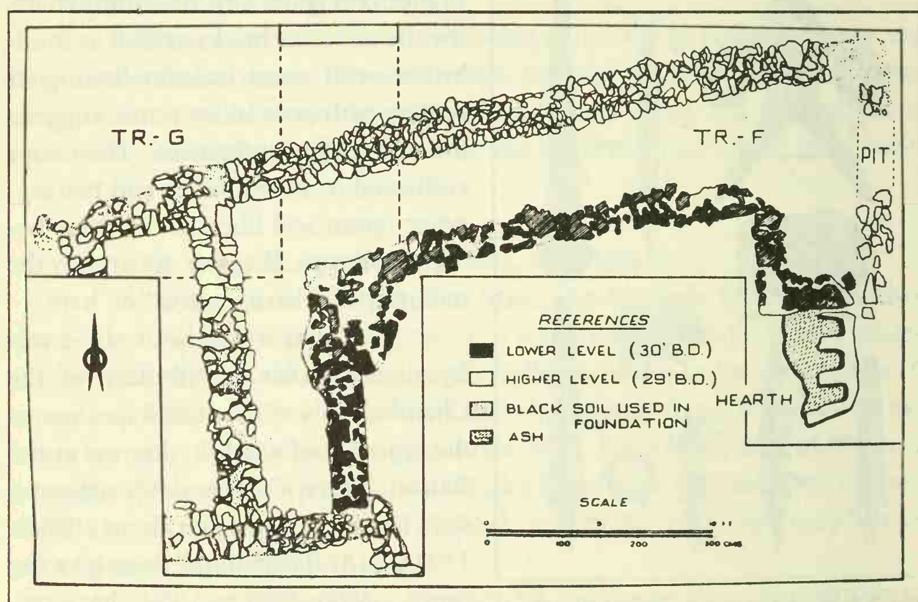


FIG. 3.5 Remains of house at Ahar: ground plan. (After H.D. Sankalia)

Madhya Pradesh and a large part of Maharashtra after 2000 BC has been given the name of **Malwa** culture. Its area swings in a long wide arc from Inamgaon in Maharashtra, curving northward to embrace Navdatoli on the Narmada, and then extending northeastward up to Eran and Tripuri in Madhya Pradesh. In Maharashtra, it succeeded the Savalda culture, which was an essentially Neolithic culture with some copper tools and a pottery made on the slow wheel (2000–1700 BC). The dates for the Malwa culture in Madhya Pradesh are therefore earlier (roughly 2000–1400 BC) than in Maharashtra (about 1800–1400 BC).

Crops of both seasons were cultivated in the Malwa culture area: wheat, barley, lentil, rice (a late intrusion), ragi, beans, grass-pea, black, green and horse-gram, and linseed. In Maharashtra rice is not attested except at Inamgaon, where it may belong to the subsequent Jorwe culture. No trace of cotton has been found, though if the pierced pottery discs found in some abundance are not toy wheels but spindle-whorls, then, we may expect that cotton might have been cultivated. The characteristic Malwa pottery is wheel-made black-on-red, with a large variety of shapes and designs. The painting is highly stylized with geometrical patterns, and animal and, rarely, human figures. The channel-spouted bowl, found at Navdatoli (*Figure 3.6*) may be of West Asian inspiration; but the spouted ceramic vessel (*lota*), among the earliest of its kind, found at Inamgaon (*Figure 3.7*), seems to be indigenous, a possible earlier example in handmade grey ware being reported from Tekkalakota, a site of the South Indian Neolithic culture. At Inamgaon and Daimabad, the houses were usually rectangular, built of low mud walls with

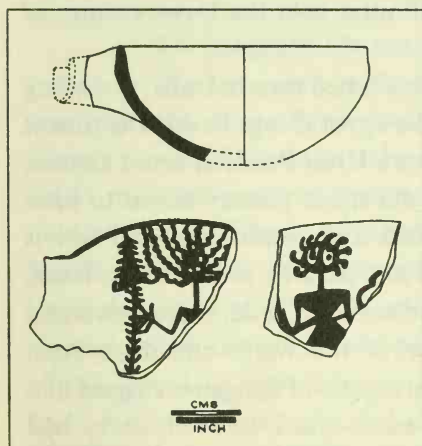


FIG. 3.6 Channel-spouted bowl with painting, Navdatoli. (After H.D. Sankalia)

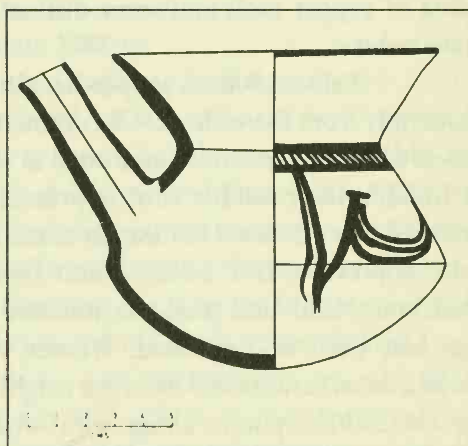


FIG. 3.7 Spouted vessel (ceramic), Inamgaon. (After M.K. Dhavalikar)

wattle-and-daub construction above. In a house dubbed a temple by the excavators, fire altars and charred grains were found. Beads of steatite, faience and other materials accompanied some of the dead, who were either buried in urns or in pits.

In Maharashtra, the Malwa culture tended to be replaced, from 1500 BC onwards, by the Jorwe culture, also Chalcolithic, about which our information is considerable; but it lies outside the period of this monograph.

As copper-use reached Maharashtra after 2000 BC, it began to penetrate the **Neolithic culture of South India** (mainly Karnataka and Andhra). In *Prehistory*, Chapter 3.5, we had touched on its earliest phase, 3000–2100 BC. Cattle, sheep and goat had by then been domesticated and ground tools suggest the consumption of grains, but no crop has yet been identified. A new phase is noticeable, which various carbon dates enable us to assign to 2100–1700 BC. Charred grains have been found: ragi and horse-gram had begun to be cultivated. There is a marked spread of the use of stone axes and ground tools, but there are also a few artefacts of copper and bronze. A gold object of this period has been found at Tekkalakota; this may be taken as evidence of an early exploitation of the gold mines in the area. More settled conditions than in the earlier Neolithic phase are reflected in the presence of mud-floors and traces of wattle-and-daub construction of circular huts. At Watgal, both extended and urn burials of the Malwa culture type have been found within the habitational area. A rock art, with figures of cattle and other animals, dancing figures, etc., had developed by this period, though it is usually very difficult to date individual representations. It was only after 1500 BC that a new phase in South Indian Neolithic can be identified, with a still larger influx of copper tools and some distinct affinities with the Jorwe culture of Maharashtra.

Before 1500 BC, copper-use also penetrated eastern India, spreading apparently from the earlier OCP culture of the upper Ganga basin. The time it appeared at the sites so far excavated in **eastern Uttar Pradesh** is not certain. At Imlidih, the neolithic cord-impressed hand-made pottery seems to have persisted till *c.* 1500 BC; but the list of cultivated crops, both kharif and rabi, is quite impressive: rice, barley, wheat (bread and dwarf), jowar, bajra, lentil, green gram, field- and grass-pea, mustard and sesame. Cattle, sheep, goats and pigs had been domesticated. Houses were of the wattle-and-daub type. Carbon dates (calibrated) from the neighbouring site of Sohgaura suggest that the chalcolithic phase, along with wheel-made black-and-red ware, had arrived there by 1500 BC. In **Bihar**, at Senuwar and Chirand, and possibly at Taradih copper intruded into essentially Neolithic cultures as early as 1800 BC.

Rice, barley, wheat (dwarf variety), lentil and field-pea were already being cultivated in the Neolithic phase. Wheel-made pottery (consisting notably of burnished red-and-grey ware) was the dominant form, while the Vindhyan Neolithic corded ware also occurs (for which, see *Prehistory*, Chapter 3.4).

Passing into **West Bengal**, we find the beginning of the Chalcolithic period datable to about 1700 BC at Bharatpur and Mahisadal, though the carbon dates from Hatkira and Pandu Rajar Dhibi are distinctly later. Along with copper, wheel-turned pottery of black-and-red ware becomes common. Rice was cultivated, and cattle had been domesticated. In Orissa the site of Golbai Sasan displays a similar sequence, pottery in the Neolithic phase being handmade and cord-impressed, while wheel-made pottery made its appearance in the Chalcolithic phase.

The source of copper in eastern India might have been the Dalbhum and Singhbhum deposits in southern Jharkhand, which are believed to have been exploited in premodern times. Proximity to these deposits might explain the presence of a large number of **copper hoards** found in Jharkhand and Chhattisgarh. A remarkable hoard of 424 copper objects (total weight over 200 kilograms) and 102 light silver pieces (a chief's storehouse and treasury?) was found at Gungeria, south of Jabalpur in Madhya Pradesh. Unfortunately, these cannot be dated, though their primitive forms suggest an early phase of copper-use.

When copper came to be used in northeastern India is equally uncertain. In Manipur, the site of Napchik has yielded, along with purely Neolithic tools, handmade cord-impressed pottery, with a thermoluminescence date within 2000–1300 BC. There was no copper there as yet.

3.4 Language Change before 1500 BC

We have seen in *Prehistory*, Chapter 2.1, that some two million years ago, the *Homo habilis* had achieved such a sufficient development of Broca's area in his brain as to be able to speak. But his 'speech' probably consisted more of gestures, grunts and shrieks, rather than words. This was because anatomically he was unable to gain enough control over exhalation or breathing necessary for proper speech. How much the *Homo erectus* improved upon this capacity is still an open question; the hole in the lowest vertebra through which the spinal cord passes was still too small. It was the Anatomically Modern Man, spreading out of Africa over 100,000 years ago, who finally had a fully developed capacity for speech. He could frame words and set them in sentences ('syntax'). This is a feature common to all the known languages of mankind, however primitive the speakers. The number of languages that

were spoken before the Neolithic Revolution must have been enormous, since we know from modern studies that the more primitive the human societies, the more numerous are the languages spoken. Thus, the indigenous inhabitants of Papua, about two million in number, speak about 750 languages, belonging to possibly over 60 language families!

As human interaction increased, trade networks became wider; and each of the individual states brought under its control larger and larger areas, within which it tended to use a single language. Languages with smaller numbers of speakers, then, began to disappear. Migrations could also lead to the swamping of the older natives' language(s) by the language of the emigrés; or a dominant section ('elite') of the population might impose its language on the rest. There has, accordingly, been a large reduction in the number of languages spoken since the Neolithic Revolution: this general statement, perhaps, can be made quite safely for India as well.

Languages themselves change with time, but they yet carry a large number of traces of their early state, as well as of the parent languages out of which they have arisen. Such traces help us to identify languages that, having the same parents and ancestors, belong to the same families and sub-families (or branches). (See Note 3.1.)

In India, not only are there some major languages (such as those listed in the Constitution of the Indian Union), but many other languages also, though usually spoken by smaller numbers of people. The bulk of the spoken languages can be grouped among the following four 'families':

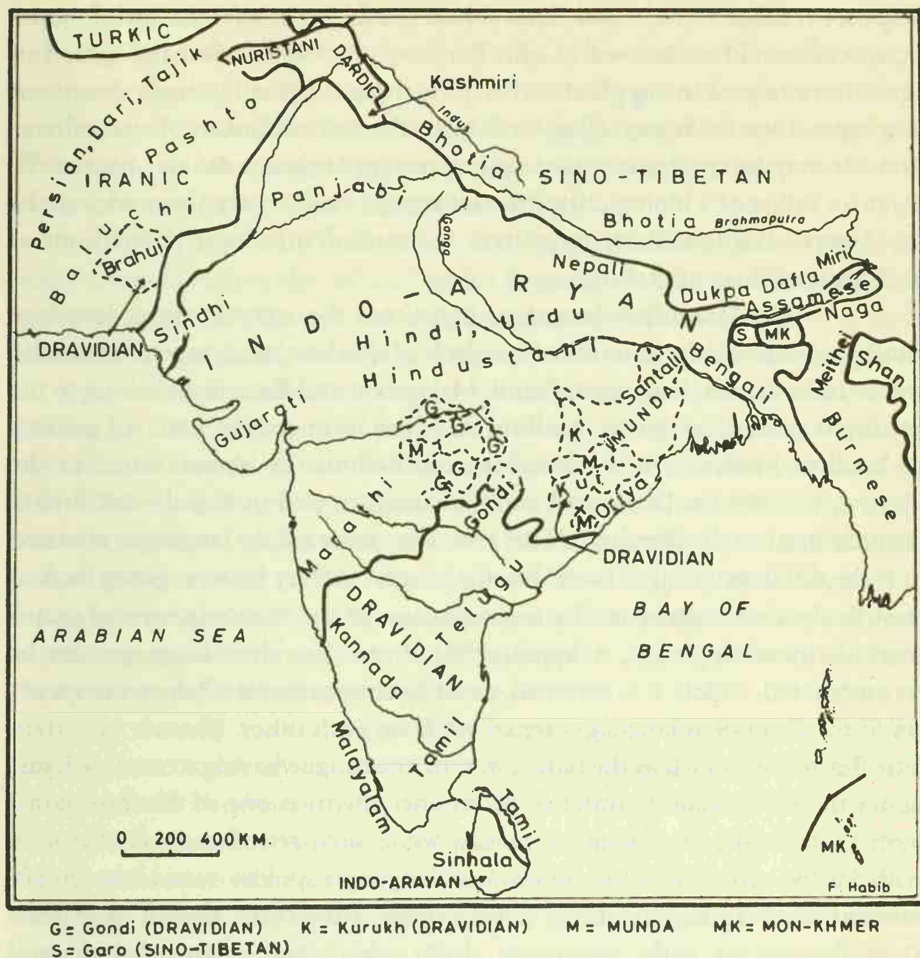
1. Sino–Tibetan: Tibeto-Burmese branch
2. Austro–Asiatic: Munda and Mon-Khmer branches
3. Dravidian: Southern, Central, Southcentral and Northern branches
4. Indo–European: Indo–Aryan or Indic, Dardic, Iranic and Nuristani branches.

(See *Map 3.3.*)

The **Sino–Tibetan** family calls for the least comment. The languages belonging to it are all spoken in Northeast India and the Himalayas bordering the area where languages of the Tibeto–Burmese branch are spoken, principally in the Tibet region of China, Bhutan and Myanmar (Burma). Only the Garo language spoken in western Meghalaya is separated from the main Tibetan zone in the north by a narrow belt of Indo–Aryan languages (Bengali and Assamese); and this Indo–Aryan intrusion may have occurred much later than the arrival of the Tibeto–Burmese branch in the area.

The **Austro–Asiatic** family, on the other hand, is singular. Khasi,

Map 3.3 Languages and Language Families



spoken in eastern Meghalaya, belongs to the Mon–Khmer branch, being considerably isolated from its sister languages in Southeast Asia. The Munda branch includes Mundari and Santali in Jharkhand, Bihar and Orissa. Savara in south Orissa and Korki on the Maharashtra–Madhya Pradesh border, much further to the west, form two distinct small pockets. Whereas the Munda branch is confined to India, the Mon–Khmer branch includes such languages outside India as Vietnamese, Khmer (in Cambodia) and Mon (in Myanmar, or Burma, and Thailand). It is likely from the distribution of the Austro–Asiatic families, that the original ancestral language was spoken in Southeast Asia, and that as rice cultivation spread from there, after 5000 BC, peasant communities speaking languages derived from it spread out.

Assimilating or bypassing local Palaeolithic or Mesolithic hunting communities, they reached Eastern and Central India well before 3000 BC. Such linguistic spread would accord with Colin Renfrew's hypothesis that the spread of agriculture helped to supplant earlier numerous tongues by single dominant languages. (See *Prehistory*, Chapter 3.4, for the early diffusion of rice cultivation.) It may be emphasized that such spread of language did not necessarily mean an influx of a biologically different strain ('race'), since those who spoke the Austro–Asiatic dialects must have intermixed with local populations at each stage of their migration.

The **Dravidian** languages constitute the second largest language family in India, being, in terms of numbers of speakers, next only to those who speak 'Indo–Aryan' languages. Tamil, Malayalam and Kannnada belong to the Southern group; Telugu (in Andhra) and Gondi (in widely scattered pockets of Madhya Pradesh) to the Southcentral; Kolami (in Maharashtra) to the Central; Kurukh (in Jharkhand and Chhattisgarh and in Nepal) and Brahui (Baluchistan) to the Northern. There are also many minor languages attached to these different groups. Tamil has the longest literary history, going back at least to the first century BC. By a comparison of the vocabularies and grammars of these languages, a hypothetical Proto-Dravidian language can be reconstructed, which, it is assumed, must have been spoken before the speakers of the Dravidian languages separated from each other. The use of certain retroflex sounds (such as the hard *l*, *n*, *r*, *rh*, the tongue having to curl back just under the hard palate in order to pronounce them) is one of the most common traits in the Dravidian languages, while such retroflexion is absent in both Austro–Asiatic and Indo–European languages spoken outside the Indian subcontinent. It is, therefore, a reasonable conjecture that it is Proto-Dravidian or its early successors, from which the Austro–Asiatic and Indo–Aryan languages derive their retroflex consonants.

This inference has many consequences. Retroflexion, as well as a few words (more than two dozen) of possible Dravidian origin, are present in the *Rigveda*. Since retroflexion is totally absent in the *Avesta*, the earliest Iranian text, which is very close otherwise to the *Rigveda* in vocabulary and grammar, one must assume that the Rigvedic reciters introduced retroflexion in the pronunciation of even the most impeccable Indo–Iranian words, under the influence of the pronunciation of speakers of the earlier local languages. Since the Rigvedic hymns were composed in the area between the Hindukush and the Ganga, this makes it very likely that some of the 'substrate' languages of the Punjab or upper Indus basin at the time were members of the Dravidian family. The likelihood is increased by the geographical proximity of the Brahui

language, whose speakers today are to be found in northeastern Baluchistan, not far from the Punjab. Brahui's own case for antiquity has been strengthened by David MacAlpin's discovery of links between it and Elamite, though the exact extent of the links may be disputed. Similarly, connections have been seen between Proto-Dravidian and the Uralic languages of Eastern Europe and Siberia; and this would also suggest that there were once Dravidian speakers in latitudes much farther to the north than today.

We have seen, in Note 2.1, that there are strong hints in the Indus script towards linking the 'official' Indus language to the Dravidian family. It is also probable that the cultural unity based on agriculture in the Indus basin aided the expansion of this official language at the cost of other languages.

That Dravidian languages were also being spoken in South India at the time, is hard to be certain about. Parpola has advanced the thesis that the extension of copper-use and the increase in crop inventory that we can trace after 2000 BC, through the Malwa and Jorwe cultures, into Southern India, marks a migration of Dravidian speakers from the north. Upon arrival there, a small number of Dravidian languages could have supplanted the numerous separate languages of the earlier nomadic pastoralists, as agriculture, crafts and commerce spread over larger areas. This, however, is a hypothesis which, at the moment, is hard to prove or disprove.

Among the Indo–European languages, the **Indo–Aryan** or Indic languages are today spoken by a majority of the population of South Asia. These include Hindustani (the spoken form of Hindi and Urdu), Marathi, Gujarati, Bengali, Punjabi, Sindhi, Oriya, Assamese, Sinhala (Sri Lanka), Nepali and many other languages. The Dardic branch, close to Indo–Aryan, consists of a set of languages in the far north of India, among which Kashmiri alone is a major literary language. Then, there are Iranic languages, to which Pashto and Baluchi in Pakistan belong. The Nuristani languages, spoken in distant valleys of northwestern Afghanistan and north NWFP, belong neither to the Indo–Aryan nor to the Iranic branch, and have many archaic features.

It happens that the earliest known languages of the Indo–Aryan and the Iranic families, the Rigvedic and Avestan, were so close that they easily enable philologists to reconstruct a Proto-Aryan (or 'Proto-Indo–Iranian') language. The word *arya* or *airya* in both the *Rigveda* and *Avesta* designates the noble, the high-born, with often a clear colour of both ethnicity and territoriality about it (compare 'Arya-varta' of ancient Indian texts with the *Young Avesta*'s 'Airyanem-vaejo'). The use of 'Aryan' as a designation of the Indian and Iranian branches of the Indo–European family, therefore, is quite valid; so also the name 'Indo–Aryan' for the Indian branch alone. Such use of the name

'Aryan' has no racist connotations; but the designation should not be extended to the Indo–European family as a whole, or to any of its other branches, least of all the Germanic, for which the Nazis so improperly used the name 'Aryan'.

There is, however, no doubt that the Aryan or Indo–Iranian group of languages belongs to the Indo–European family, as one can see from the similarities in many words in ordinary usage, like those for father, mother, daughter, brother, etc. Being struck by such similarities between Sanskrit, Old Persian, Greek, Latin and the Germanic languages, Sir William Jones announced his discovery of their relationships in 1786. Subsequent research has not only added a large number of other languages to the family, but also established a sequential order of changes, whereby the older ('archaic') forms of words can be distinguished from the later. From such effort, the purely hypothetical vocabulary of the ancestral 'Proto-Indo–European' language has been built up. The reconstructed vocabulary suggests that those who spoke the ancestral language practised pastoralism and plough agriculture, knew of horses (whether wild or domesticated is not certain), and had copper, gold and silver. By and large, such conditions suit those of the large belt of steppe territory from the Ukraine to eastern Kazakhstan, before *c.* 3000 BC, as established by archaeological finds; and it might well be that Proto-Indo–European was actually spoken in some part of this belt. No case can possibly be made for Proto-Indo–European having originated in India.

The first firm date for the Aryan group of languages, after their branching off from the parent Indo–European stem, is provided by the great Boghazkoy archives (Turkey), which are mainly in Hittite, itself an old Indo–European language. Here, among the records in yet another language, Hurrian, have been found words and names derived from the language of the rulers of Mitanni (*c.* 1500–1300 BC) in upper Mesopotamia (northeastern Syria). (See *Map 1.1.*) The Mitanni rulers in a treaty, *c.* 1380 BC, invoked the gods, Mi-it-tra, U-ru-w-na, In-da-ra and Na-sa-at-ti-ia-an-na (Mitra, Varuna, Indra and the Nasatyas of the *Rigveda*). The Mitanni rulers bore names such as Tushratta (Sanskrit: Dasharatha or Tvishratha), and Mattiuaza (Sanskrit: Mativaja). Kikkuli of Mitanni wrote in Hurrian a text on horse-training, in which he uses the word *wartanna* (Sanskrit, *vartana*) for turn or turning, and the words *aika*, *tera*, *panza*, *satta*, for numbers one, three, five and seven, in which the Sanskrit equivalents are clearly recognizable. There is such proximity between the surviving Mitanni words and the language of the *Rigveda* that it is difficult to imagine that there was any great distance in time or space

between the Mitanni and their separation from the main body of Indo–Aryan speakers. The separation probably took place not before 2000 BC and in a region not much beyond eastern Iran. Since the Mitanni shared with the *Rigveda* composers a deep interest in horses and chariots, the presence of the true domesticated horse should be the one necessary marker for the presence of their common (linguistic) ancestors in the archaeological record.

The potsherd depictions of the horse and the presence of horse-bones in Ghalighai Culture IV of Swat (1800–1400 BC) in NWFP, the clay figurines of horses and riders from Pirak Ib (1600–1400 BC), and horse-bones from Pirak III (1300–800 BC) in northeastern Baluchistan (see above, 3.2) are, therefore, of crucial importance. One can pursue the traces of horse-rearing as it diffused earlier from the great steppes of the Ukraine, southern Russia and Kazakhstan. In northeastern Afghanistan, at Darra-i Kur, not far from Shortughai, horse-bones have been found in a pastoral Chalcolithic context, datable to 2200–1900 BC. And from looted graves of north Afghanistan has come a bronze statue, attributed to the Bactria and Margiana Archaeological Complex (BMAC) (1900–1700 BC), showing a rider on a horse. Such evidence does not mean that all these Copper Age societies were necessarily those of Indo–Aryan speakers; but once the horse was there, they had one attribute definitely required for it. Moreover, the Indian borderland and north Afghanistan, both fringe the zone where the Mitanni are likely to have separated from the other Indo–Aryan speakers. In prehistory, it is difficult to get a greater degree of probability than this.

If the Indo–Aryan speakers were settled at Swat and Pirak before 1500 BC, the time was not far off when they would move into the Punjab. Possessing horses and chariots (the word *ratha* for chariot in the *Rigveda* is matched by *rathi*, charioteer, in the *Avesta*; so it is a Proto-Aryan word), they would have a decisive advantage over their eastern foes, who still had only ox-carts (to judge from the terracotta figurines of Cemetery-H and Late Indus cultures). The *Rigveda* shows familiarity with the Suvastu (Swat) river and, indeed, with much of Afghanistan, so that one must assume that after Indo–Aryan speech expanded into the Punjab (the *Rigveda's* heartland) linguistic unity was maintained between the borderland and the Punjab for quite some time.

Such extension of Indo–Aryan speech must have involved the migration of a certain number of people from the borderland into the Indus plains. But it is unlikely that the migration was on such a massive scale as to leave its imprint on the genetic complexion of the region. We may remember

that the population of the territory of the Indus civilization was probably around four million (see Chapter 2.1), and even if we allow for a certain degree of depopulation upon the civilization's disappearance, we can hardly imagine it to have fallen by more than half. There were, therefore, probably some two million people still inhabiting the Indus basin at the time. We cannot obviously conceive of a mass migration of this magnitude from areas in the borderlands, which, being largely mountainous, could have maintained only sparse populations. Moreover, since the Indo–Aryan speakers had settled in these areas for some time previously, they must have already mixed with populations which, being neighbours to the Indus people, were not probably biologically much different from the latter. A movement of even a hundred thousand such persons over a period of time (say, 200 years) should still have left the Indus basin population 'racially' unaffected.

What we know from historical records about the Mitanni from a slightly later period, 1500–1300 BC, may well give us a picture of what could have happened in the Indus basin. There, in upper Mesopotamia, the Indo–Aryan speakers of the Mitanni kingdom comprised rulers, warriors, charioteers, horse-trainers and, perhaps, priests (indicated by the continued allegiance to the Indo–Aryan deities). Yet, the major part of the population of the kingdom continued to speak the Hurrian language, which did not even belong to the Indo–European family. The Mitanni ruler Tushratta (Dasharatha?) himself wrote to the Egyptian pharaoh, *c.* 1400 BC, a letter in Hurrian in 500 lines. A condition of bilingualism thus prevailed. But since Hurrian, being a written language, was strongly entrenched, the Indo–Aryan speech there remained an elite language only, and then entirely disappeared. In the Indus basin, however, with the disappearance of the Indus script (and, presumably, of the official language that was written in it), there was no such strong rival facing Indo–Aryan. Indeed, there might have been only several small 'substrate' languages. We have seen that some of them were probably Dravidian, to judge from the appearance of retroflexion and some Dravidian words in the *Rigveda.*

There was, however, another set of languages which were neither Dravidian nor Austro–Asiatic, but have also furnished non-Indo–European words to the *Rigveda* and early Sanskrit. Interaction with such languages in Afghanistan probably began much before the Indo–Aryan speakers entered India, and might well be responsible for the early appearance of a unique feature of Indo–Aryan languages, namely, 'Prakritism'. This consists of simplifying the Indo–Aryan word structure, characteristically dispensing with compound consonants (usually replaced by single consonants, for example, *puta*

for *putra*, son). Some Prakritisms are found not only in the *Rigveda* but also in Mitanni speech: for the Sanskrit *ashva* (horse) Mitanni has *assu*, and for the Sanskrit *sapta* (seven) it has *satta.* Such simplification must have helped to spread Indo–Aryan speech among ordinary people, for it is almost certain that Rigvedic Sanskrit, like the later Sanskrit, remained a language of the few. By the sixth century BC it was the Prakrit language of each region that the people understood; and so it was in the Prakrit of Magadha that Lord Mahavira and Gautama Buddha gave their sermons. If Indo–Aryan speech may be imagined to have mainly spread by way of 'elite dominance', the people yet had a share in determining its popular form, namely, Prakrit.

TABLE 3.2 Chronological Table, *c.* 2000–1500 BC

A. *Indus Basin and Western Borderlands*		
BC		
2100–1400	Sibri–Mehrgarh VIII culture	
2000	Shahr-i Sokhta: post-urban settlement	
2000–1500	Jhukar culture	
2000–1500	Cemetery-H culture	
2000–1500	Shahi Tump Culture	
2000–1200	'Late Harappan' culture, Sutlej-Ganga region	
1900–1600	Post-Indus culture in Gujarat	
1800–1400	Swat Culture IV	
1800–1300	Pirak Bronze culture	
B. *Cultures outside the Indus Basin*		
BC		
3000–1300	Banas culture:	
	3000–2000	Balathal
	2400–1300	Ahar
2800–1500	OCP culture	
2400–1800	Kayatha culture	
2100–1700	Southern Neolithic, with occasional occurrences of copper	
2000–1400	Malwa culture: in Maharashtra, from 1800 BC	
2000–1700	Savalda culture	
2000–1300	Napchik, Neolithic site in Manipur	
1800	Copper at Senuwar and Chirand, Bihar	
1700	Copper at Bharatpur and Mahisadal, West Bengal	
1500–1300	The Mitanni in upper Mesopotamia	

Note 3.1

Reconstructing Language History

Prehistory is defined as the period of human life for which we have no written records; and physical remains, which are studied by archaeology, may be held to constitute our sole source of information for it. For all practical purposes, the period called Protohistory is also not much different, since we cannot read (as is the case with the Indus script) the written material that has come down from it. But there does remain one other possible source of information, namely, language survivals. Languages existed long before they came to be written down. If we can establish what words and names (both personal and place names) survived from those times, and what such words meant (plough, hut, mother, father, cattle or horse, deity or ghost, etc.), we can reconstruct at least in part the material conditions, social relationships and beliefs of the people who used these words. This becomes possible from a study of the vocabulary and syntax (or sentence structure) of early languages from the time they were written down.

The broad discipline under which such study falls is known as **linguistics**. That branch of linguistics which, by comparing the vocabularies and structures of different languages, attempts to reconstruct their past, is called **philology**, or comparative and historical linguistics. The comparative methods developed by philology enable us to see which languages are genetically linked with each other, that is, have a common ancestor, and how, given such common ancestry, they have evolved in different directions, in respect of both word forms and sentence structure. By meticulous comparisons, a genealogical tree of languages can be built up, a large language family being made up of sub-families, branches or groups. When such a tree has been constructed, one can proceed back, stage by stage, locating, first, the common vocabularies and grammatical traits within the individual branches, and, then, among the allied branches, which will reduce the number of common words as well as traits. When, ultimately, we reach the top, we will have the partial vocabulary of an ancestral language, which does not itself exist.

An example will perhaps best show what the procedure we have described entails. In the Indo–European family, the word for 'horse' is *ashva* in Vedic Sanskrit and *aspa* in Avesta. Since the Avestan language attests a change from *v* to *p*, the ancestral language of the group to which the two languages belong, called Proto-Aryan, must have had the word **asva* for the horse. An asterisk precedes the word to show that the word is merely a reconstructed one, there being in existence no Proto-Aryan text containing it. Now, Proto-Aryan was a *satem* language, that is, a language in which *k* in certain words tends to be converted into *s*. In *centum* languages, where this has not happened, the words for 'horse' include *yakwe* in Tocharian (western China), *equs* in Latin, *ech* in Old Irish and *eoh* in Old English. (Such words being similar and taken as descended from the same ancestral language, are called 'cognates'.) We infer from these that there *was* a word for horse in the ancestral language of the entire

Indo–European family (Proto-Indo–European), and that the likely form of that word was **(h)ekwos.*

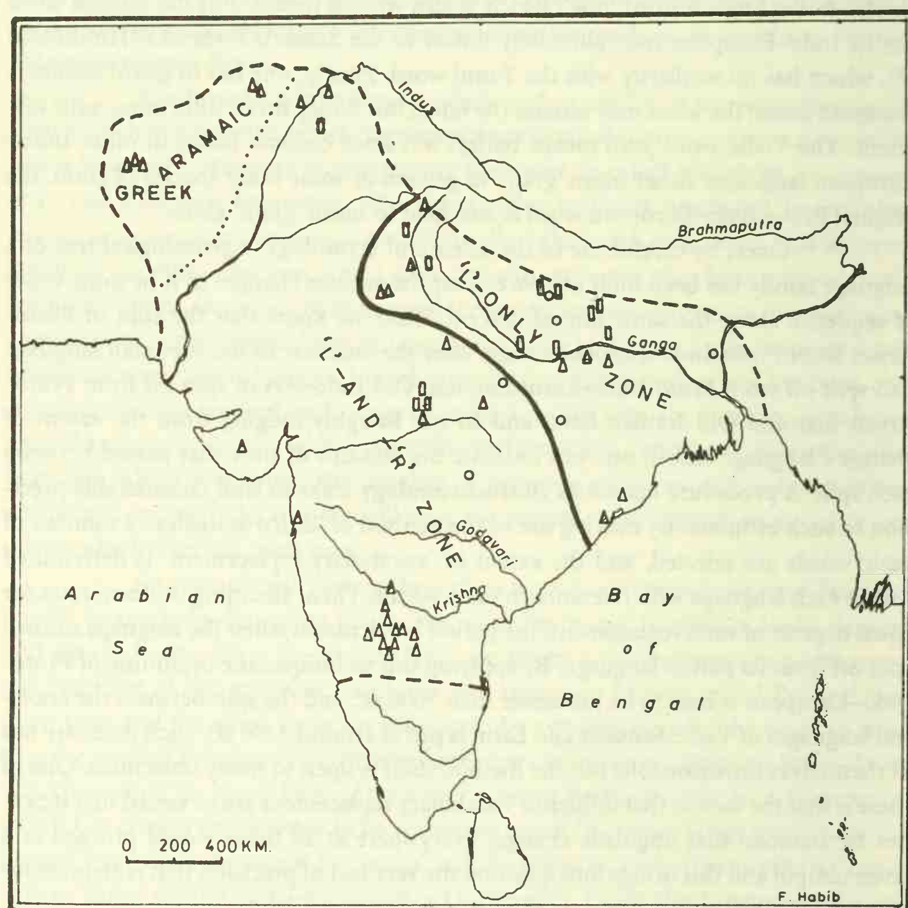
Such reconstructions of words are achieved by the study of **etymology**. Etymology is simply the history of each word, traced by comparing its forms (and senses) from its earliest occurrence in each language, and then by locating similar forms in other languages in order to arrive at the common ancestral form. Much etymological work is concerned with identifying words that have entered one language from another belonging to a different branch or family. Such words are termed *loan words.* The word for betel-leaf is *tambula* in Sanskrit and *tambul* in Persian, but this is a loan word from the former to the latter. There was, therefore, no Proto-Aryan word like **tambula* endowed with this meaning. Etymologists also have to avoid building on chance similarities. Tamil, a Dravidian language, has the word *onnu,* which looks very similar to the English word 'one', which is also what it means. But the English word has its Indo–European root ultimately linked to the Sanskrit form *eka* (Hindustani *ek*), which has no similarity with the Tamil word. Finally, one has to guard against a change in sense: the word may remain the same, but it may mean something quite different. The Vedic word *yava* means barley, but since cognate forms in other Indo–European languages either mean 'grain' in general or some other species of grain, the original Proto-Indo–European word is also held to mean 'grain' alone.

Once, by careful use of the science of etymology, a genealogical tree of a language family has been built up, we can set the various changes in it in some order of sequence along the same line of descent. Thus we know that the split of Proto-Aryan from Proto-Indo–European came after the ancestor of the Albanian language had split off from Proto-Indo–European; that Old Indo–Aryan split off from Proto-Aryan first and Old Iranian later; and so on. Roughly judging from the extent of change ('language shift'), one can estimate the amount of time that passed between each split. A procedure known as **glottochronology** seeks to lend considerable precision to such estimates by making use of the method of 'lexico-statistics': a number of basic words are selected, and the extent of 'vocabulary replacement' is determined within each language with reference to these words. Then, assuming uniform rates for equal degrees of such replacement, the period is calculated when the language studied split off from its parent language. By applying this technique, the beginning of Proto-Indo–European is held to be no earlier than 5000 BC, and the split between the ancestral languages of Vedic Sanskrit and Latin is put at around 3300 BC. Such dates are not in themselves unreasonable, but the method itself is open to many objections. One of these is that the factors that influence vocabulary replacement are so varied that it cannot be assumed that linguistic changes everywhere at all times would proceed at a given tempo; and this brings into question the very fact of precision that is claimed for glottochronology.

Let us now return to the vocabulary of the ancestral language of each family or branch that philologists are able to establish. Such reconstructed vocabulary will

always be incomplete, so that we can establish with some confidence what things the people who spoke the reconstructed old language were familiar with, but we cannot deduce their ignorance of certain things from the absence of words for them in the reconstructed vocabulary. There are also other difficulties. The territories where languages are spoken shift; and it is not always easy to fix, from the available vocabulary, where particular languages were spoken in prehistoric times. Here, a device based on isoglosses may be of some help. An *isogloss* is the boundary line between two linguistic traits, plotted on a map. Suppose we find that within one zone of the territory of a language both consonants 'l' and 'r' are properly in use, but that in a particular zone 'l' supplants 'r' in all words, and the latter consonant is not, in fact, used at all. This is

MAP 3.4 Ashokan Prakrit, *c.* 250 BC: The 'L' Isogloss



the case with the Ashokan Prakrit (third century BC), where the 'R'-and-'L' and 'L' zones can be separated by an isogloss. We can, then, suppose that there might have been a language earlier than Ashokan Prakrit, spoken in the 'L'-only zone, which simply did not have the consonant 'r'. Such a 'substrate' language is not otherwise known, but its territory can be identified by drawing an isogloss based on Ashokan inscriptions. (See *Map 3.4.*)

Most languages tend to be spoken in geographically defined regions, since their spread depends on the degree of human interaction. People tend to mix more and intermarry within such regions, so that in course of time a broad correspondence between genetic and linguistic frontiers begins to emerge. But such correspondence is misleading. There are no genetic controls by which one person speaks one language better than another. In other words, particularities of pronunciation are transmitted not by birth, but through what a person hears, especially in childhood, both at home and outside. Thus, there is no necessary association between a language group and a genetic group, which in popular parlance is called a race.

This can be shown by many examples. Turkic is a relatively young family of languages (no older than 1,500 years), now spoken over a large area of Asia and Europe. Much of the spread of these languages was caused by migrations, originally from Mongolia and western China, that are fairly well documented by historical sources. Yet, the people of Turkey, the leading Turkish-speaking country, are 'Caucasoids', genetically very close to Greeks, and quite distant from the oldest Turkic-speaking people, the Uighurs of western China, who are 'northern Mongoloids'. In India, no marked genetic differences are observable among speakers of the Munda (Austro–Asiatic), Dravidian and Indo–European languages, all being classed as Caucasoids. There cannot, therefore, be an Aryan (Indo–Iranian) race, and, even less, an Indo–European one.

Note 3.2
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Irfan Habib, formerly Professor of History at the Aligarh Muslim University, is a well-known historian and the author of *The Agrarian System of Mughal India* (1963), *An Atlas of the Mughal Empire* (1982), and *Essays in Indian History: Towards a Marxist Perception* (1995). He is currently working on a People's History of India to be published in the form of successive monographs under the auspices of the Aligarh Historians Society, each of which will be edited or authored by him.

Cover illustrations:
Indus seals from Harappa, depicting animals; an ivory pendant from Rehman Dheri; rising wells at Mohenjo Daro

Cover design: Ram Rahman

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